

**ENVIRONMENTAL ASSESSMENT  
CONSTRUCTION OF AIR TRAFFIC CONTROL TOWER**

**TINKER AIR FORCE BASE, OKLAHOMA**



**United States Air Force  
Air Force Materiel Command**

**Tinker Air Force Base, Oklahoma**

**March 2009**

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**FINDING OF NO SIGNIFICANT IMPACT:  
CONSTRUCTION OF AIR TRAFFIC CONTROL TOWER  
TINKER AIR FORCE BASE  
OKLAHOMA CITY, OKLAHOMA**

**Introduction**

Air Force Materiel Command Headquarters (AFMC/HQ) prepared an Air Traffic System Evaluation in 2004 that determined that the Air Traffic Control Tower (ATCT) operating at Tinker Air Force Base (AFB) in Oklahoma had a control tower cab that is too small for current operations. The existing ATCT facility is more than 35 years old and was built with limited equipment space and designed to accommodate only air traffic control (ATC) operations. Although multiple upgrades and repairs to the tower have been required over the years, several components of the existing ATCT do not comply with United States Air Force (USAF) and Unified Facilities Criteria (UFC) standards and siting criteria. The required number of personnel, combined with required equipment upgrades, continues to reduce available space in the cab, which is unsuitable for day-to-day operations. The overcrowded conditions jeopardize flying safety and periodically delay flying operations. Further, demands placed on the existing tower make it unsuitable for further expansion and degrade the adequacy of the work environment. Without a new ATCT at Tinker AFB, flight safety, as well as safety associated with taxiing aircraft or vehicular movement on airfield surfaces, would remain impaired.

To rectify this situation, the USAF proposes to construct a new ATCT in accordance with current standards, codes, siting criteria and Department of Defense (DoD) antiterrorism/force protection (AT/FP) requirements.

This Environmental Assessment (EA) addresses the potential impacts of the Proposed Action on the human and natural environment as required by the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [USC] §§ 4321-4347), and in accordance with the Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500-1508) and Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (32 CFR Part 989).

**Description of Proposed Action**

The Proposed Action consists of the construction of a new 7,448-square foot, 11-story ATCT at Tinker AFB meeting current USAF standards. The construction would include reinforced concrete, drilled piers, a foundation and floor slab, supporting superstructure, an elevator, fire protection systems, back-up power, lightning protection, utilities, communications support, site preparation and drainage, access road and turnaround area, and other necessary support for a complete and usable facility. The total construction footprint, including parking and access road, is estimated to be 16,300 square feet.



**Alternative 2: No-Action Alternative.** Under the No-Action Alternative, Tinker AFB would not implement the Proposed Action, and current inefficiencies associated with overcrowded conditions in the tower cab would continue. These overcrowded conditions jeopardize flying safety and delay flying operations. Extensive building maintenance requirements would persist, and the ATCT would continue to operate in an area that violates USAF siting criteria.

Although this alternative would not fulfill the purpose and need of the Proposed Action, this alternative will be carried forward as required by the CEQ, which stipulates that the No-Action Alternative must be considered to assess environmental consequences that may occur if the Proposed Action is not implemented.

#### **Anticipated Environmental Effects**

	<b>Under Implementation of the Proposed Action:</b>
<b>Air Quality</b>	Increased particulate matter less than 10 microns in diameter (PM <sub>10</sub> ) emissions resulting from proposed construction activities would comprise short-term adverse impacts that could be mitigated through standard dust minimization practices. Once operational, long-term emissions from developed facilities would be negligible. Given that the proposed ATCT would house similar equipment currently in use in the existing ATCT, no new equipment that would have substantial emissions would be introduced. Emissions generated by implementation of the Proposed Action are expected to be below <i>de minimis</i> levels.
<b>Noise and Vibration</b>	Impacts of the Proposed Action would include short-term construction noise and long-term operational noise resulting from the back-up generator. These impacts would not result in notable changes in airfield noise contours and would be consistent with the existing surrounding noise environment. However, current noise at the proposed site is 75 to 80 Day-Night Average Sound Level (L <sub>dn</sub> ); therefore, noise reduction will be required within the ATCT. Noise and vibration impacts of the T-10 Hush House located near the Proposed Action site were evaluated to determine if they would be compatible with the proposed ATCT. These uses were found to be consistent. Negligible noise impacts would result from implementation of the Proposed Action.
<b>Land Use</b>	Since implementation of the Proposed Action would not require changes to land use designations or be considered incompatible with the Tinker AFB General Plan and Oklahoma City Southeast Sector Plan, implementation of the Proposed Action would not result in land use incompatibility or inconsistency in the vicinity of Tinker AFB.
<b>Geological Resources</b>	Implementation of the Proposed Action would require grading and site preparation would be required to support the building and parking area. Negligible impacts would result from implementation of the Proposed Action.
<b>Water Resources</b>	Contaminants, such as petroleum hydrocarbons, in run-off from developed areas of the site, including parking lots, could impact water quality in the area. These impacts would be minimized assuming existing non-point source pollution requirements are met and spill prevention and response procedures are implemented at the site. Further, implementation of best management practices (BMPs) – such as silt fencing, berm construction around construction sites, etc. – would minimize this potential to negligible impacts during construction. Over the long-term, no operations that would affect surface water are anticipated to occur. The Proposed Action site does not overlie any known groundwater contamination. It is unlikely that groundwater quality would adversely affect or be affected by constructing a new facility on this site assuming required controls for the handling of hazardous materials and for spill prevention and cleanup are implemented to protect groundwater. Implementation of the Proposed Action would not eliminate or modify any existing wetlands on Tinker AFB. No 100-year or 500-year floodplains have been identified on the proposed project site. However, since the current ATCT facility is located in a designated 100-year floodplain, removal of the current ATCT facility would reestablish permeable surface to the existing floodplain.

### **Finding of No Significant Impact**

After careful review of the potential impacts of this Proposed Action, I have concluded that the action's implementation would not have a significant impact on the quality of the human or natural environment or generate significant controversy. Accordingly, the requirements of NEPA and CEQ regulations and 32 CFR 989, et seq. have been fulfilled, and an Environmental Impact Statement (EIS) is not necessary and will not be prepared.



ALLEN J. JAMERSON, Colonel, USAF  
Commander, 72<sup>nd</sup> Air Base Wing

4 May 09

DATE



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**TINKER AIR FORCE BASE, OKLAHOMA**



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**March 2009**

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## LIST OF ACRONYMS AND ABBREVIATIONS

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°F	degrees Fahrenheit	EIG	Engineering Installation Group
38 EIG	38 <sup>th</sup> Engineering Installation Group	EIS	Environmental Impact Statement
72 ABW	72nd Air Base Wing	EO	Executive Order
507 ARW	507 <sup>th</sup> Air Refueling Wing	ERP	Environmental Restoration Program
AFB	Air Force Base	ESA	Endangered Species Act
AFCEA	Air Force Civil Engineer Support Agency	FAA	Federal Aviation Administration
AFH	Air Force Handbook	FEMA	Federal Emergency Management Agency
AFI	Air Force Instruction	FICON	Federal Interagency Committee on Noise
AFMC/HQ	Air Force Materiel Command/Headquarters	FONSI	Finding of No Significant Impact
AGE	aerospace ground equipment	GWTP	Ground Water Treatment Plant
AGL	above ground level	HAP	Hazardous Air Pollutant
AGS	Air Guard Station	HMMP	Hazardous Materials Management Program
AICUZ	Air Installation Compatible Use Zone	HMMS	Hazardous Material Management System
AIRFA	American Indian Religious Freedom Act	HUD	US Department of Housing and Urban Development
ANSI	American National Standards Institute		
AP	Accumulation Point	Hz	Hertz
APZ	Accident Potential Zone	I-	Interstate
AST	aboveground storage tank	IAP	Initial Accumulation Point
ATC	Air Traffic Control		
ATCT	Air Traffic Control Tower	ICRMP	Integrated Cultural Resource Management Plan
AT/FP	Antiterrorism/Force Protection		
Airlift Wing	Airlift Wing	IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
AWAC	Airborne Warning and Control		
B	Building	IRP	Installation Restoration Program
BACT	best available control technology	IWTP	Industrial Wastewater Treatment Plant
BASH	Bird/Wildlife Aircraft Strike Hazard	JP-	jet fuel
bgs	below ground surface	kVA	kilovolt-amperes
BMP	best management practice	L <sub>dn</sub>	Day-Night Average Sound Level
BRAC	Base Realignment and Closure	LLSZ	Lower-Lower Saturated Zone
CAA	Clean Air Act	LQG	Large Quantity Generator
CAAA	Clean Air Act Amendments	LSZ	Lower Saturated Zone
CE	Civil Engineering	LUC	land use control
CEQ	Council on Environmental Quality	MIL HDBK	Military Handbook
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	MLRA	major land resource area
CFR	Code of Federal Regulations	MSDS	Material Safety Data Sheets
CMS	corrective measure studies	MS4	Municipal Separate Storm Sewer
CNG	Compressed Natural Gas	MSGP	Multi-Sector General Permit
CO	carbon monoxide	NAAQS	National Ambient Air Quality Standards
CP	Collection Point	NAGPRA	Native American Graves Protection and Repatriation Act
CWA	Clean Water Act	NAVAID	Navigational Aid
CZ	Clear Zone	NEPA	National Environmental Policy Act
dB	decibels	NESHAP	National Emission Standards for Hazardous Air Pollutants
dba	A-weighted decibels		
DEQ	Oklahoma Department of Environmental Quality	NFPA	National Fire Protection Association
DoD	U.S. Department of Defense	NHPA	National Historic Preservation Act
DRMO	Defense Reutilization and Marketing Office	NO <sub>2</sub>	nitrogen dioxide
EA	Environmental Assessment	NO <sub>x</sub>	nitrogen oxides
ECAMP	Environmental Compliance Assessment and Management Program	NPL	National Priorities List
EIAP	Environmental Impact Analysis Process	NRHP	National Register of Historic Places
		NWI	National Wetlands Inventory
		O <sub>3</sub>	ozone
		OC-ALC	Oklahoma City Air Logistics Center

**LIST OF ACRONYMS AND ABBREVIATIONS (Cont.)**

OCC	Oklahoma Corporation Commission
OCCVB	Oklahoma City Convention and Visitors Bureau
ODWC	Oklahoma Department of Wildlife Conservation
ONHI	Oklahoma Natural Heritage Inventory
ORBCA	Oklahoma Risk-Based Corrective Action
OU	University of Oklahoma
OWRB	Oklahoma Water Resources Board
PA	preliminary assessment
Pb	lead
PM	particulate matter
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter
POL	petroleum, oil, and lubricants
POV	privately owned vehicles
PPV	peak particle velocity
PSD	Prevention of Significant Deterioration
PZ	Production Zone
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigations
RI/FS	remedial investigations/feasibility studies
RMS	root mean square
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SOF	Supervisor of Flying
STP	Sanitary Treatment Plant
SWPPP	Storm Water Pollution Prevention Program
TAFBI	Tinker Air Force Base Instruction
T-ETVS	Transportable-Enhanced Terminal Voice Switch
TCP	Traditional Cultural Property
TPW	Texas Parks and Wildlife
tpy	tons per year
TSDF	Treatment, Storage and Disposal Facility
UFC	Unified Facilities Criteria
UPS	Uninterruptible Power Supply
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	U.S. Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
USZ	Upper saturated zone
VOC	volatile organic compound
WSA	Waste Staging Area

## SECTION 1 OVERVIEW

### 1.1 Introduction

Air Force Materiel Command Headquarters (AFMC/HQ) prepared an Air Traffic System Evaluation in 2004 that determined that the Air Traffic Control Tower (ATCT) operating at Tinker Air Force Base (AFB) in Oklahoma had a control tower cab that is too small for current operations. The existing ATCT facility is more than 35 years old and was built with limited equipment space and designed to accommodate only air traffic control (ATC) operations. Although multiple upgrades and repairs to the tower have been required over the years, several components of the existing ATCT do not comply with United States Air Force (USAF) standards and siting criteria. The required number of personnel, combined with required equipment upgrades, continues to reduce available space in the cab, which is unsuitable for day-to-day operations. The overcrowded conditions jeopardize flying safety and periodically delay flying operations. Furthermore, demands placed on the existing tower make it unsuitable for further expansion and degrade the adequacy of the work environment. Without a new ATCT at Tinker AFB, flight safety, as well as safety associated with taxiing aircraft or vehicular movement on airfield surfaces, would remain impaired.

To remedy this situation, the USAF proposes to construct a new ATCT in accordance with current standards, codes, siting criteria, and Department of Defense (DoD) antiterrorism/force protection (AT/FP) requirements.

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### 1.2 Purpose and Need

The *purpose* of the Proposed Action is to construct a new ATCT that is large enough to accommodate air traffic control operations, controller administrative functions, personnel training, crew briefings, electronic equipment maintenance, radio and telephone support equipment, and environmental controls. Construction of a new ATCT would also facilitate compliance with current USAF siting criteria for control towers, provide an adequate fire suppression system, and result in several upgrades over the current ATCT (e.g., safer stairways, the ability of the tower to withstand greater wind speeds, safer access to the exterior of windows [for cleaning], and a new roof).

The *need* for the Proposed Action has arisen because the existing ATCT facility (Building 935) was designed and built in 1970 to accommodate only air traffic control operations and has limited equipment space. Structural, mechanical, and electrical components of the existing tower facility have deteriorated to the point that frequent repairs are required. To date, base Civil Engineering (CE) personnel have been able to accomplish these repairs and renovations; however, costs associated with these elevated maintenance requirements will soon exceed the benefits associated with prolonging the tower's lifespan. Further, in its present location, the ATCT violates current USAF siting criteria and Unified Facilities Criteria (UFC) 3-260-01, which state that towers will not be sited less than 1,000 feet from an active runway centerline. Additionally, while operations of the ATCT have remained relatively constant, an increasing number of personnel working in the tower cab, along with equipment additions and upgrades, will eventually render the cab space unsuitable for day-to-day operations.

There is insufficient space available to carry out the administrative, training, and management functions associated with tower operations. The tower cab, which comprises the top floor of the control tower within which tower personnel direct air traffic, is too small to accommodate all the occupants and trainees. Cramped conditions in the tower cab make it difficult for the controllers to maneuver and to monitor aircraft activity through the tower cab windows. The *2004 Air Traffic System Evaluation* prepared by AFMC/HQ states: "The size and noise level in the tower cab is far from ideal in accommodating the five control positions." During the evaluation period, as many as 12 people were in the tower cab performing official duties and if measures are not taken to limit the number of people or modify/replace the tower cab, the noise level and attendant distractions may lead to an erosion of the quality of air traffic control service." It has been mandated that a new position for the Supervisor of Flying (SOF) be in the control tower cab, which will further constrain the already limited space.

The ATCT consists of ten floors and the tower cab and has a small elevator serving the first eight floors. Conventional steel stairs serve as the primary access from the first floor to the tenth floor, with a steep "ship's ladder" providing access to the tower cab from the tenth floor. A small, half-height door serves as access to the narrow tower catwalk. An emergency "Baker-Life Chute" mounted on the tower catwalk serves as an alternate means of egress in case of fire. The set of stairs leading to the tower cab is steep and not very deep. Several controllers have fallen or lost their footing and slid down these steps. One controller was unable to work for several months with a head injury that resulted from a stairway fall. The current USAF-standard tower design does not contain these types of stairs.

The existing ATCT is substandard and is not adequate to allow renovation to incorporate all current ATCT functions. It is neither cost effective nor practical to renovate the existing ATCT cab in order to comply with the current Life and Fire Safety standards and seismic requirements.



In addition to major functional and location issues cited above, numerous nuisances associated with the current ATCT would also be rectified under development of a new ATCT, including:

- Leaking roofs and ceilings;
- Offices without central heating/air conditioning; and
- Replacement of noisy and poorly sealed heating/ air conditioning wall units, which permit internal wind drafts and seasonal insect infestations.

### **1.3 Location, History, and Current Mission**

#### **1.3.1 Tinker AFB**

Tinker AFB is located within the city limits of Oklahoma City, 5 miles east of downtown (Figure 1-1). The main portion of the base is bordered to the north by Interstate 40 (I-40) and 29<sup>th</sup> Street, to the east by Douglas Boulevard, to the south by 74<sup>th</sup> Street, and to the west by Sooner Road. Midwest City and Del City are located north and northwest of Tinker AFB, respectively.

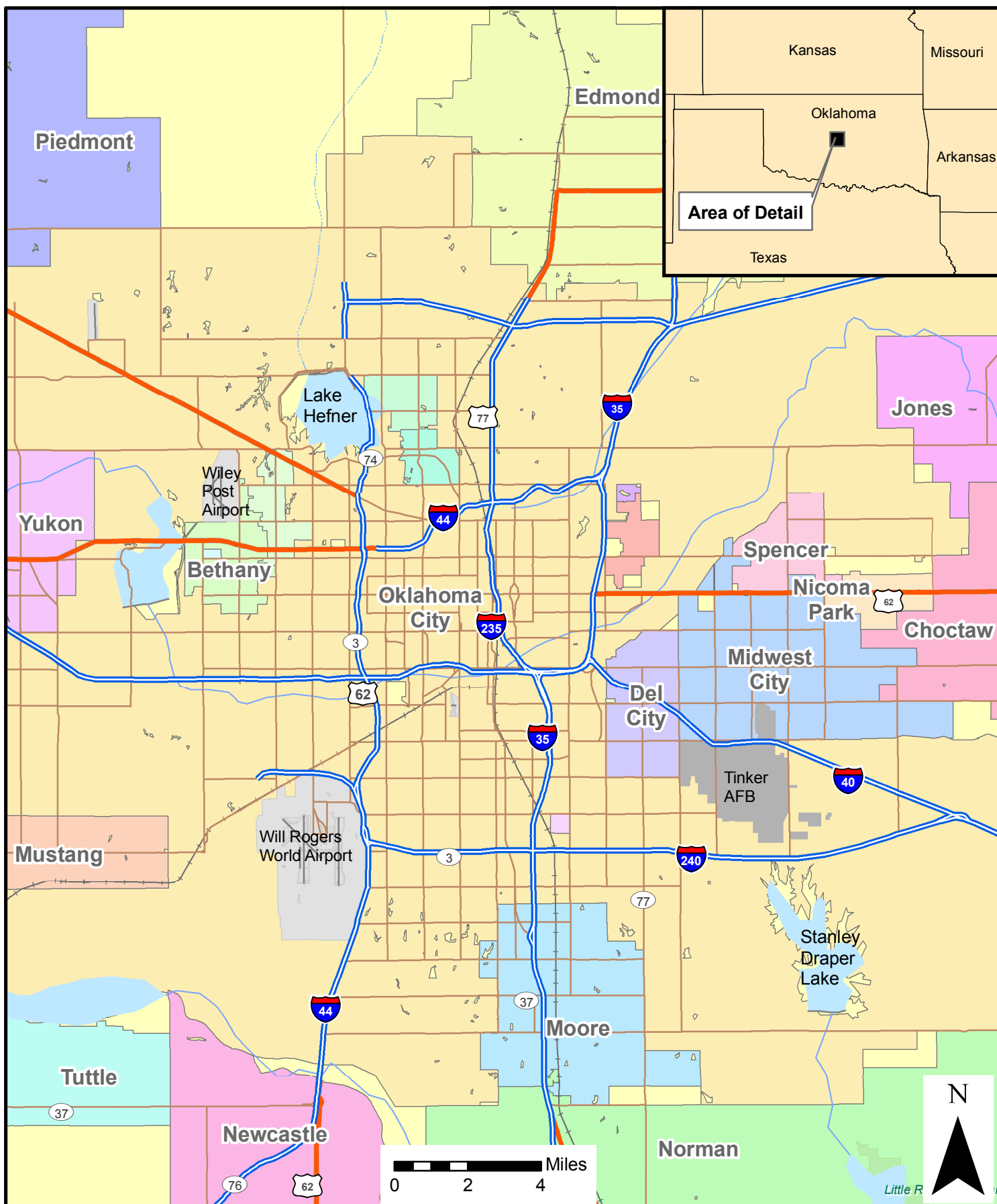
Tinker AFB's history began in 1940 when a group of Oklahoma City civic leaders and businessmen learned that the War Department was considering the central United States as a location for a maintenance and supply depot. On 8 April 1941, the order was officially signed awarding the depot to Oklahoma City.

Oklahoma Air Depot was renamed "Tinker AFB" in honor of Major General Clarence L. Tinker of Pawhuska, Oklahoma. General Tinker lost his life while leading a strike against Japanese forces on Wake Island during the early months of World War II.

Since its establishment, Tinker AFB has expanded its real property assets to include more than 5,033 acres. In the 1960s, 1970s, and 1980s, the base acquired maintenance responsibilities for additional aircraft, engines, and equipment; the additional associate organizations and responsibilities resulted in an increase in both civilian and military personnel. In the 1970s, the base took over management of new weapons including the A-7D Corsair, the E-3A Airborne Warning and Control (AWAC) aircraft, the E-4 Airborne Command Post aircraft, and air- and ground-launched missiles.

Tinker AFB's largest organization is the Oklahoma City Air Logistics Center (OC-ALC). The OC-ALC is the largest of three Air Logistic Centers in the AFMC and provides depot maintenance, product support, services and supply chain management, as well as information support for 31 weapon systems, 10 commands, 93 Air Force bases, and 46 foreign nations. The OC-ALC is the worldwide manager for a wide range of aircraft, engines, missiles, software, and avionics and accessories components.

Currently, Tinker AFB contains 716 buildings (comprising 15.9 million square feet), an airfield, and other facilities that support various associate units at the base (Figure 1-2). Tinker AFB provides specialized logistics support, management, maintenance, and distribution to



EA

**Regional Location  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

FIGURE

1-1



EA

**Layout Map**  
**Construction of Air Traffic Control Tower**  
**Tinker Air Force Base**

FIGURE

1-2

defense weapons systems worldwide. Tinker AFB is divided into seven districts, each with specific land uses. The 72<sup>nd</sup> Air Base Wing (72 ABW) is the host command. Associate units located at the base include the OC-ALC, the 552<sup>nd</sup> Air Control Wing, the 507<sup>th</sup> Air Refueling Wing, the United States (U.S.) Navy Command Strategic Communications Wing One, the 3<sup>rd</sup> Combat Communications Group (3 CCG), and the 38<sup>th</sup> Engineering Installation Group (38 EIG).

### 1.3.2 72 ABW

Serving as the host organization at Tinker AFB, the 72 ABW provides critical base-wide functions including security, environmental, medical services, civil engineering, planning, fire protection, supply, communications, and airfield operations. The 72 ABW was activated at Tinker AFB on 1 October 1994. Organizations assigned to the 72 ABW include: 72<sup>nd</sup> Medical Group, 72<sup>nd</sup> Support Group, 72<sup>nd</sup> Operations Support Squadron, 72<sup>nd</sup> Civil Engineering Group, 72<sup>nd</sup> Logistics Directorate, the Base Chapel, and the offices for Plans, Military Equal Opportunity, International Military Students, and Arms Control.

## 1.4 Summary of Environmental Study Requirements

The Environmental Impact Analysis Process (EIAP) is the process by which federal agencies facilitate compliance with environmental regulations. NEPA is the primary legislation affecting these agencies' decision-making process. This act and other facets of the EIAP are described below.

### 1.4.1 National Environmental Policy Act

NEPA requires that federal agencies consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to this process. In 1978, the CEQ issued *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR §§1500-1508 [CEQ 1978]). The Air Force developed its own procedural regulations for implementing NEPA entitled *Environmental Impact Analysis Process* (AFI 32-7061, codified at 32 CFR Part 989). These regulations specify that an EA be prepared to:

- Briefly provide sufficient analysis and evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- Aid in an agency's compliance with NEPA when no EIS is necessary; and
- Facilitate preparation of an EIS when one is necessary.

Furthermore, to comply with other relevant environmental requirements (e.g., the Safe Drinking Water Act, Endangered Species Act [ESA], and National Historic Preservation Act [NHPA]), and to assess potential environmental impacts, the EIAP and decision-making process for the proposed action involves a thorough examination of all environmental issues pertinent to the

action. The decision-making process includes a study of environmental issues related to the proposed operations changes at Tinker AFB.

#### **1.4.2 Scope of the Environmental Assessment**

This EA will address the full breadth of potential environmental, cultural and socioeconomic impacts associated with the Proposed Action. The geographic area addressed will include the Proposed Action site and immediately surrounding environs. In addition to the Proposed Action, the EA will assess potential impacts associated with reasonable alternatives to the Proposed Action and actions associated with the Proposed Action.

Resources analyzed will include the standard required Critical Elements of the Human Environment, as defined by NEPA, as well as additional issues identified by Tinker AFB staff and the USAF. The scope of analyses is based on the requirements of CEQ and the additional resources were identified by Tinker AFB staff.

#### **1.4.3 Interagency and Intergovernmental Coordination for Environmental Planning**

Public involvement is a useful component of the EA process; it includes both agencies and members of the public. Public involvement occurs primarily during the 15-day public comment period.

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) is a federally mandated process for informing and coordinating with other governmental agencies regarding proposed actions. As detailed in 40 CFR § 1501.4(b), CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the IICEP process (per AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*), the USAF notifies relevant federal, state, and local agencies and allows them sufficient time to make known their environmental concerns specific to a proposed action. Comments and concerns submitted by these agencies during the IICEP process are subsequently incorporated into the analysis of potential environmental impacts conducted as part of the EA.

Application for and acquisition of the Federal Aviation Administration (FAA) Form 4060 Permit to Construct will also be required prior to implementation of the Proposed Action; as part of that application process, the FAA will receive a copy of the EA. The draft EA was sent directly to identified agencies, and a Notice of Availability for public review of the Draft EA was published in *The Oklahoman* on February 20, 2009 (Appendix A). The Draft EA was available for public review at the Midwest City Public Library. The public review period lasted 15 days and no public comments were received; therefore, no responses to comments were needed to be incorporated as part of the Final EA.



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## SECTION 2

### DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

#### 2.1 Introduction

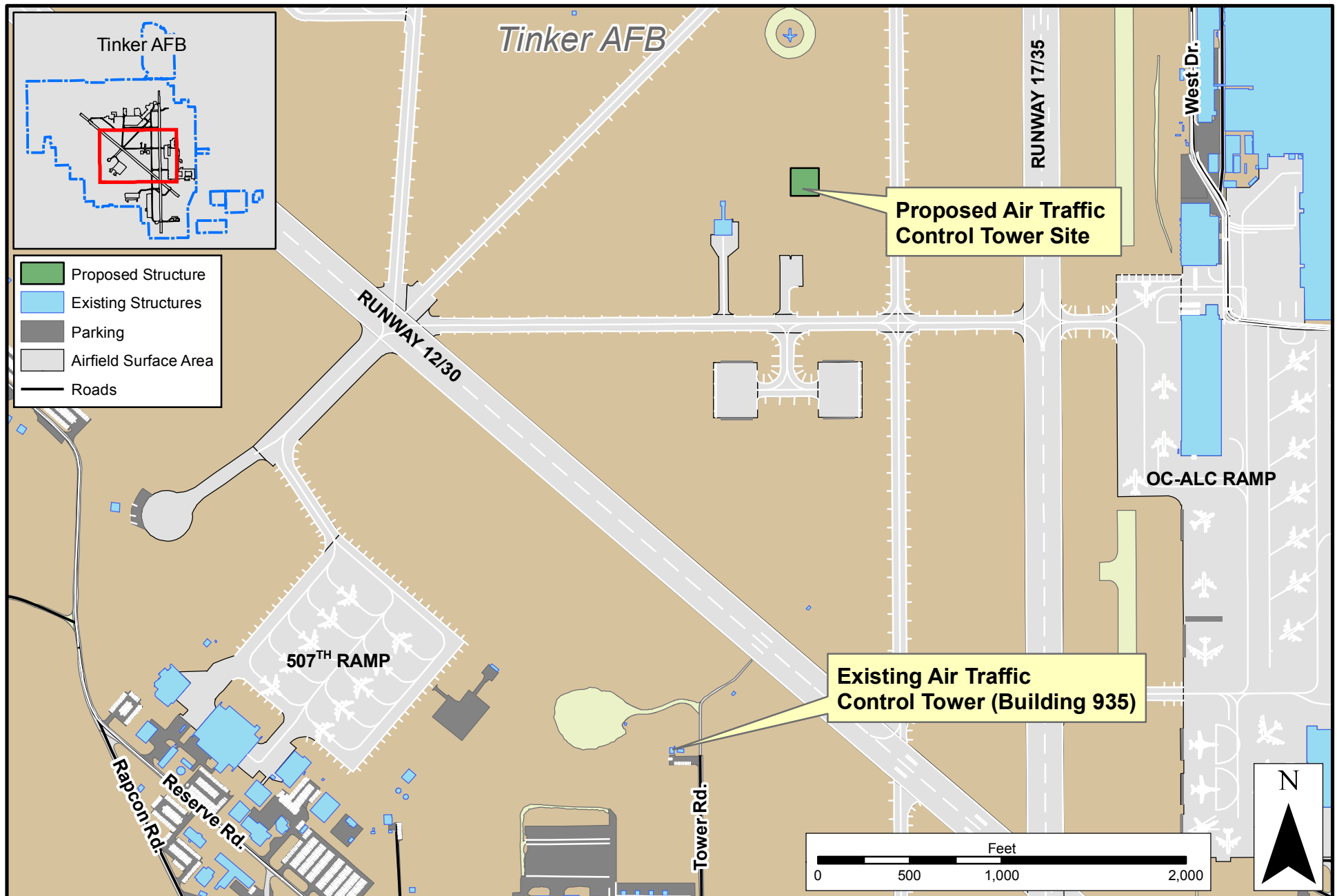
The USAF has determined that a new ATCT at Tinker AFB, Oklahoma is necessary to provide adequate space for air traffic control operations and to comply with current USAF siting criteria, which require the ATCT to be sited more than 1,000 feet from the runway centerline. Furthermore, a new, properly sited ATCT at Tinker AFB would provide air traffic controllers a clear view of the runways, traffic patterns, alert areas, restricted areas, and parking aprons to ensure adequate and safe airborne and ground traffic control at and around the airfield.

The new ATCT must be constructed to comply with UFC 3-260-01 for *Airfield and Heliport Planning and Design* (Air Force Civil Engineer Support Agency [AFCEA] 2006) and the *Design Guide for Air Traffic Control Towers (ATCT)* (USAF 2001b). The new tower must also comply with AT/FP requirements which would minimize the possibility of mass casualties in buildings or portions of buildings owned, leased, privatized, or otherwise occupied, managed, or controlled by or for the DoD (DoD 2003). These standards provide appropriate, implementable, and enforceable measures to establish a level of protection against terrorist attacks. The intent of these standards is achieved through prudent planning, real estate acquisition, and design and construction practices; these standards apply to new facilities and to existing facilities when undergoing major investments, conversion of use, building additions, or glazing replacement. As required by NEPA, the potential impacts of the Proposed Action on the human and natural environment must be evaluated, and reasonable alternatives to the Proposed Action must be considered.

#### 2.2 Proposed Action

The Proposed Action (Project WWYK093003) consists of the construction of a new 7,448 square foot, 11-story ATCT at Tinker AFB meeting current USAF standards (Figure 2-1). The construction would include reinforced concrete, drilled piers, a foundation and floor slab, supporting superstructure, an elevator, fire protection systems, back-up power, lightning protection, utilities, communications support, site preparation and drainage, access road and turn around area, and other necessary support for a complete and useable facility. In addition, a stand-alone tornado shelter would be located outside the base of the tower. The total construction footprint, including parking and access road, is estimated to be 16,300 square feet.

The overall height of the new ATCT including the cab and antennas would be approximately 140 feet above ground level (AGL). This equates to an 11-story tower structure plus a tower cab (ten floors at 10 feet, 6 inches; one mechanical floor at 15 feet; and one tower cab and accompanying antennas at 20 feet). The elevation of the functional work surface in the new ATCT's cab would be 120 feet AGL, which would satisfy architectural requirements and ensure adequate depth perception. Under the guidance set forth in UFC 3-260-01, Control Towers are



EA

**Proposed Action**  
**Construction of Proposed Air Traffic Control Tower**  
**Tinker Air Force Base**

**FIGURE**  
**2-1**

permissible deviations to the Airfield Siting Criteria as long as the tower is not a controlling obstacle for a missed approach. This height is necessary to provide adequate visibility for taxiways/runways, provide minimum angle requirements for depth perception to the furthest aircraft traffic surface on the airdrome, and provide necessary equipment, training, briefing, and administrative space. The control tower would be designed using the U.S. Air Force *Design Guide for Air Traffic Control Towers* as a baseline document and would conform to the requirements of Military Handbook (MIL HDBK) 1190, *Facility Planning and Design Guide*, and MIL HDBK 1008C, *Fire Protection for Facilities* (USAF 2001b).

The floor designation is as follows:

**Table 2-1 Floor Designated Use for the Proposed ATCT**

Floor	Designated Use
First Floor	Telephone Distribution, Mechanical Yard
Second Floor	Administrative Office
Third Floor	Chief Standards Evaluation/Chief ATC Training Office
Fourth Floor	Chief Controller Office
Fifth Floor	Training Room
Sixth Floor	Briefing Room
Seventh Floor	Tower Simulator Room
Eighth Floor	Lower Electronics Equipment Room
Ninth Floor	Upper Electronics Equipment Room
Tenth Floor	Break/Ready Room
Eleventh Floor	Transfer Level
Top Floor	Control Tower Cab

Note: With the exception of the Control Tower Cab, Mechanical Room, and Equipment Rooms, other floor designations may be exchanged to meet operational needs.

The Proposed Action would include the establishment of 24 parking spaces. An existing, active taxiway would be converted for use for vehicles accessing the proposed tower; an access drive would be constructed between the existing taxiway and the new parking area.

Electrical power would be 120/208, 60 Hertz (Hz), plus or minus 10 percent. A 120-140 kilovolt-Amperes (kVA) back-up generator with auto change-over and uninterruptible power supply (UPS) for all technical power requirements would be included. An equipotential grounding system would be installed in the control tower cab, simulator room, and the two equipment rooms in accordance with Military Standard 188-124B.

An airfield lighting control panel, connected to the airfield lighting vault, would be required for the new ATCT. The size, configuration, and location of the panel would be in accordance with FAA Advisory Circular No. 150/5345-3D, Specifications for L821 panels for remote control of airport lighting (8 August 1986). The current fiber optic controlled lighting control panel and associated controls would be relocated to the new control tower.

All existing communication lines/circuitry for Navigational Aid (NAVAID) monitors and radio transmitters/receivers terminating in the existing tower would be relocated to the new ATCT. The existing base duct system for field lighting cables, primary power cables, control cables, telephone cables, and meteorological cables would be relocated in the area of the proposed ATCT. Existing cables within the construction zone would need to be field-verified and relocated subsequent to ground-breaking for the new complex.

Once the new ATCT is constructed, programming action would be initiated by the base Communications Squadron to relocate electronics equipment from the old control tower to the new facility. Additionally, simulator equipment and activity would be moved from the existing building to the new ATCT. The Communications Squadron would make arrangements to obtain the Transportable-Enhanced Terminal Voice Switch (T-ETVS). The T-ETVS will allow “hot-cutover” of the existing voice switch from the old facility to the new, eliminating the need to procure a replacement switch.

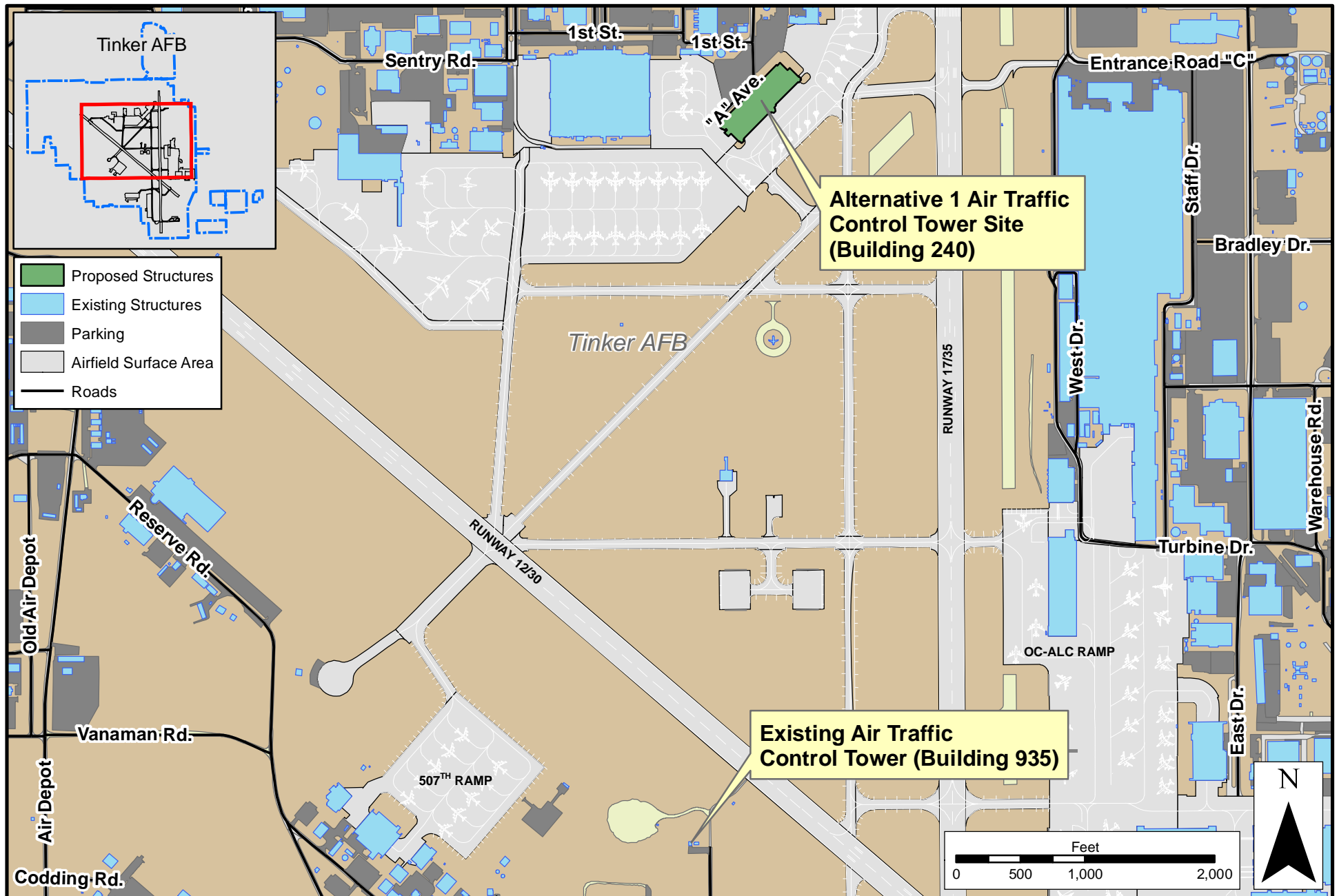
Upon completion of the new tower construction and cut-over (i.e., ATC operations commencement), the existing tower would be dismantled. This would include the demolition of the existing control tower (Building 935), parking lot, and access road (27,620 square feet). The existing stand-alone tornado shelter and simulator building would be either moved to another location(s) or demolished. The existing tower site would be converted to grass.

## **2.3 Alternatives**

Alternative locations for the new ATCT were evaluated. Four alternatives to the Proposed Action were identified, including the No-Action Alternative. Each alternative’s adequacy for implementing the project’s objectives was evaluated and a summary of those evaluations are provided below.

### **2.3.1 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 would involve remodeling Building 240 to include the proposed ATCT (Figure 2-2). The location would provide adequate visibility of all airfield movement areas except the munitions ramp, which is not currently visible. In addition, siting the ATCT in this location would allow the aircraft traffic pattern to remain in a standard configuration, passing in front of the controllers. However, Building 240, constructed in 1942, is eligible for consideration as an historic building. Compliant with CEQ requirements, Alternative 1 will be carried forward and effects of implementing this alternative will be further evaluated.



EA	<p align="center"><b>Alternative 1</b>  <b>Construction of Air Traffic Control Tower</b>  <b>Tinker Air Force Base</b></p>	<p align="center"><b>FIGURE</b>  <b>2-2</b></p>
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### 2.3.2 Alternative 2: No-Action Alternative

Under the No-Action Alternative, Tinker AFB would not implement the Proposed Action, and current inefficiencies associated with overcrowded conditions in the tower cab would continue. These overcrowded conditions jeopardize flying safety and delay flying operations. Extensive building maintenance requirements would persist, and the ATCT would continue to operate in an area that violates USAF siting criteria.

Although this alternative would not fulfill the purpose and need of the Proposed Action, this alternative will be carried forward as required by the CEQ, which stipulates that the No-Action Alternative must be considered to assess environmental consequences that may occur if the Proposed Action is not implemented.

### 2.3.3 Alternatives Considered but Eliminated and Not Carried Forward

Two additional alternatives were identified but eliminated from further consideration. The first eliminated alternative entails building a modern, adequately sized ATCT at the existing ATCT site. The location would ultimately provide adequate visibility of all airfield surfaces; however, the tower, as currently sited, violates USAF siting criteria because it is less than 1,000 feet from the runway centerline. If the existing site were chosen as the location for construction of a new tower, the existing tower would need to be dismantled, and the use of a mobile tower would be required during construction. Utilization of a mobile tower as an interim facility would significantly impact wing flying operations due to limited space, equipment, and airfield visibility. In addition, construction requirements of this alternative would be located within the 100-year floodplain. Furthermore, the existing ATCT location has been identified for more suitable and compatible airfield uses, including future runway expansion and ramp construction projects. Therefore, this alternative was eliminated from further analysis.

The second alternative considered but eliminated involves constructing the proposed ATCT in an area east of Runway 17/35, midfield, adjacent to the OC-ALC complex (Figure 2-2), on the ALC side of Building 3102. The location would provide adequate visibility of all airfield surfaces; however, given the dense Air Depot ramp and parking space and the limited real estate available in the area, utilities (e.g., water, sewer, electrical, and telephone) would need to be installed to support construction and operation of the tower on this parcel. Siting the ATCT in this location would place the aircraft traffic pattern behind the controller in a non-standard configuration, potentially causing flight safety issues and requiring the relocation of operations to the west side of the airfield to allow the observation of the flight pattern in front of the controllers. This relocation would, in turn, place the aircraft flight path closer to Oklahoma City and to Will Rogers International Airport. For these reasons, this alternative was eliminated from further analysis.

## 2.4 Reasonably Foreseeable Concurrent Actions

Implementation of the Proposed Action and associated potential environmental impacts would occur concurrently with other projects and developments proposed on Tinker AFB, and in the vicinity of the base. In addition to the Proposed Action, projected projects on Tinker AFB for the next five years include:

- Depot Maintenance and Reengineering Transformation (DMRT) Three-Bay Hangar Construction;
- Construct Consolidated Fuel and Overhaul Facility;
- Military Family Housing Privatization;
- Relocation of 137 Airlift Wing of Air National Guard;
- Transfer 939 Air Reserve Wing aircraft to Tinker AFB;
- Defense Logistics Agency (DLA) Warehouse Construction;
- Construction of Medical Clinic;
- Child Development Center Construction;
- T-10 hush house (B926), B3234 Test Cell Facility, and B3772;
- Tinker Aerospace Complex (TAC);
- Harry Twaddle Acquisition;
- Construct Consolidated Wing Headquarters Facility;
- Physical Fitness Center Construction;
- Consolidated Security Forces, South 40 Development;
- Realignment of Air Depot Road/Tinker Gate; and
- Phase III, 3rd Combat Communications Complex Construction.

The projects listed above and their associated cumulative impacts are further discussed and analyzed in *Section 5, Cumulative Impacts*.

## 2.5 Summary of Potential Impacts

Potential impacts were evaluated and are described in Section 4, Environmental Consequences. Table 2-2 provides a summary of the potential impacts for resource areas fully evaluated and associated with the Proposed Action, Alternative 1, and the No Action Alternative. Table 2-3 provides a summary of resource areas that were not evaluated further due to no impacts to those resources from the Proposed Action, Alternative 1, and the No Action Alternative.



**Table 2-2 Summary of Impacts for Fully Evaluated Resources**

Resource/ Issue	Proposed Action	Alternative 1	No Action Alternative
Air Quality	Increased PM <sub>10</sub> emissions resulting from proposed construction activities would comprise short-term adverse impacts that could be mitigated through standard dust minimization practices. After initial site preparation and grading activities are completed, dust emissions would be significantly less, and once operational, long-term emissions from developed facilities would be negligible. Given that the proposed ATCT would house similar equipment currently in use in the existing ATCT, no new equipment that would have substantial emissions would be introduced. Emissions generated by implementation of the Proposed Action are expected to be below <i>de minimis</i> levels.	Implementation of Alternative 1 would result in similar impacts as the Proposed Action because the acreage for the Alternative 1 ATCT footprint, parking area, and construction staging area would be the same. However, since the new access road to the tower would be shorter in length than that of the Proposed Action, impacts to air quality would be expected to be below <i>de minimis</i> levels.	Conditions would remain as described in <i>Section 3.1, Air Quality</i> .
Water Resources	Contaminants, such as petroleum hydrocarbons, in run-off from developed areas of the site, including industrial areas or parking lots, could impact water quality in the area. These impacts would be minimized assuming existing non-point source pollution requirements are met and spill prevention and response procedures are implemented at the site. Furthermore, implementation of best management practices (BMPs) – such as silt fencing, berm construction around construction sites, etc. – would minimize this potential to negligible impacts during construction. Over the long-term, no operations that would affect surface water are anticipated to occur. The Proposed Action site does not overlie any known groundwater contamination. It is unlikely that groundwater quality would adversely affect or be affected by constructing a	Implementation of Alternative 1 would result in a potential increase for soil erosion during construction and the release of contaminants (i.e., petroleum hydrocarbons) in runoff from developed areas of the site, which could result in possible adverse impacts on water quality. BMPs would be implemented to minimize the potential for soil erosion during construction and the release of contaminants.	Conditions would remain as described in <i>Section 3.2, Water Resources</i> . The existing ATCT would continue to operate in the floodplain.

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**Table 2-2 Summary of Impacts for Fully Evaluated Resources (Continued)**

Resource/ Issue	Proposed Action	Alternative 1	No Action Alternative
	new facility on this site assuming required controls for the handling of hazardous materials and for spill prevention and cleanup are implemented to protect groundwater. Implementation of the Proposed Action would not eliminate or modify any existing wetlands on Tinker AFB. No 100-year or 500-year floodplains have been identified on the proposed project site. However, since the current ATCT facility is located in a designated 100-year floodplain, removal of the current ATCT facility would add permeable surface back to the existing floodplain.		
Biological Resources	Implementation of the Proposed Action would require the removal of vegetation on the property. The existing ATCT and parking lot footprints would be converted to grass. Indirect impacts to biological resources would be negligible on a regional scale.	Implementation of Alternative 1 would not require the removal of vegetation on the property. The existing ATCT and parking lot footprints would be converted to grass. Indirect impacts to biological resources would be negligible on a regional scale.	Conditions would remain as described in <i>Section 3.3, Biological Resources</i> .
Transportation and Circulation	Implementation of the Proposed Action would re-route current ATCT personnel's commuting traffic. The proposed route would lead southeast from "A" Avenue between buildings 230 and 240 to the taxiway leading to the new ATCT. The proposed parking area would accommodate personnel. Implementation of the Proposed Action would not increase traffic but redirect circulation to a different part of the base. Furthermore, increases in traffic volumes associated with construction activity would be short-term; upon completion of construction, no long-term impacts to transportation systems would result.	Implementation of Alternative 1 would redirect current ATCT personnel's commuting traffic. The alternative route would involve driving and parking at Building 240 in the existing parking lot. Currently, traffic in this portion of the base is heavy; therefore, implementation of Alternative 1 could increase traffic and circulation problems in this part of the base. Furthermore, increases in traffic volumes associated with construction activity would be short-term; upon completion of construction, minimal impacts to transportation systems would result.	Conditions would remain as described in <i>Section 3.4, Transportation and Circulation</i> .

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**Table 2-2. Summary of Impacts for Fully Evaluated Resources (Continued)**

Resource/ Issue	Proposed Action	Alternative 1	No Action Alternative
Cultural Resources	No National Register of Historic Places (NRHP) - listed or eligible archaeological resources have been recorded on the site, and no known federally recognized Native American lands or resources are located at Tinker AFB. If such resources were encountered or identified during project implementation, activities would be suspended and the Oklahoma State Historic Preservation Office (SHPO) would be consulted to determine the significance of the resource(s).	Building 240 is eligible for historic listing since its construction occurred in 1942. Remodeling B240 would impact cultural resources.	Conditions would remain the same as existing conditions.
Hazardous Materials and Wastes	An increase in the volume of hazardous wastes generated could occur during the demolition of the existing ATCT facility. However, the increased volume would be temporary and accommodated within the existing framework of the management, handling, or disposal processes. Only negligible impacts involving hazardous wastes would occur as a result of this alternative.	Impacts resulting from the implementation of Alternative 1 would be the same as the Proposed Action; an increase in the volume of hazardous wastes generated could occur during the demolition of the existing ATCT. However, the increased volume would be temporary and accommodated within the existing framework of the management, handling, or disposal processes. A diesel-powered generator would be on-site to provide back-up power. However, no hazardous materials would be stored on-site since no external fuel storage tank would be installed. Only negligible impacts involving hazardous wastes would occur as a result of this alternative.	Conditions would remain as described in <i>Section 3.5, Hazardous Materials and Wastes</i> .
Visual Resources	Changes to visual resources associated with the Proposed Action would include the construction of an ATCT facility and small parking area and the demolition of the existing ATCT. The existing ATCT site will be allowed to revert back to grass similar to the rest of the airfield. The visual environment of Tinker AFB does not constitute a unique or sensitive viewshed, and no detrimental impact to	Changes to visual resources associated with Alternative 1 would include the remodeling of B240 to include an ATCT facility and the demolition of the existing ATCT. The existing ATCT site will be allowed to revert back to grass similar to the rest of the airfield. The visual environment of Tinker AFB does not constitute a unique or sensitive viewshed, and no detrimental impact to local or	Conditions would remain the same as existing conditions.

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**Table 2-2. Summary of Impacts for Fully Evaluated Resources (Continued)**

Resource/ Issue	Proposed Action	Alternative 1	No Action Alternative
	local or regional visual resources would occur upon implementation of the Proposed Action. Development of the new ATCT would be consistent and compatible with the visual characteristics of the airfield environment.	regional visual resources would occur upon implementation of this Alternative.	
Safety	Implementation of the Proposed Action would benefit the safety of flying operations at Tinker AFB and the surrounding communities by improving currently unsuitable airborne and ground aircraft traffic control conditions.	Potential impacts to safety under Implementation of Alternative I would be similar to those occur under the Proposed Action and would include improving currently unsuitable airborne and ground aircraft traffic control conditions. However, there is limited parking space available in the vicinity of B240 and vehicle traffic congestion may increase. Because of increased traffic congestion, minimal adverse impacts to safety may occur.	Conditions would remain the same as existing conditions. Flight safety, as well as taxiing aircraft or vehicle movement on airfield surfaces would remain significantly impaired
Noise and Vibration	Implementation of the Proposed Action would generate short-term construction noise and long-term operational noise resulting from use of the back-up generator. This noise generation would not result in notable changes in airfield noise contours and would be consistent with the existing surrounding noise environment. However, current noise at the proposed site is 75 to 80 Day-Night Average Sound Level ( $L_{dn}$ ); therefore, noise reduction will be required within the ATCT. Noise and vibration originating from operations the T-10 hush house located near the Proposed Action site were evaluated to determine if they would be compatible with the proposed ATCT. These uses were found to be consistent. Negligible noise impacts would result from implementation of the Proposed Action.	Impacts of Alternative 1 would be identical to the Proposed Action. Implementation of Alternative 1 would not result in changes in noise contours. Negligible noise impacts would result from implementation of this alternative. The T-10 hush house is farther from the Alternative 1 site; therefore, operation of the T-10 hush house would not interfere with operation of an ATCT at the Alternative 1 site.	Conditions would remain the same as existing conditions.

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**Table 2-3. Summary of No Impact for Resources Not Evaluated Further**

<b>Resource/ Issue</b>	<b>Proposed Actions</b>	<b>Alternative 1</b>	<b>No Action Alternative</b>
Land Use	Since implementation of the Proposed Action would not require changes to land use designations or be considered incompatible with the Tinker AFB General Plan and Oklahoma City Southeast Sector Plan, implementation of the Proposed Action would not result in land use incompatibility or inconsistency in the vicinity of Tinker AFB.	Since implementation of Alternative 1 would not result in changes in land use compatibility, implementation of this alternative would not result in land use incompatibility in the vicinity of Tinker AFB.	Conditions would remain the same as existing conditions.
Geological Resources	Implementation of the Proposed Action would require grading, and site preparation would be required to support the building and parking area. Negligible impacts would result from implementation of the Proposed Action.	Implementation of Alternative 1 would involve remodeling an existing building, and would not require any grading, site preparation, or other significant ground-disturbing activity to support the building and parking area. Therefore, implementation of this alternative would not result in impacts to geological resources.	Conditions would remain the same as existing conditions.
Socioeconomics	Implementation of the Proposed Action would not increase or decrease the number of personnel at Tinker AFB; therefore, socioeconomic impacts would not result.	Implementation of Alternative 1 would not increase or decrease the number of personnel at Tinker AFB; therefore, socioeconomic impacts would not result.	Conditions would remain the same as existing conditions.
Environmental Justice and Protection of Children	Only minimal impacts would result from implementation of the Proposed Action; therefore, minority and low-income populations would not be disproportionately adversely impacted. Similarly, the Proposed Action would not cause adverse impacts in areas supporting or frequented by concentrated populations of children. Therefore, negligible impacts with regard to environmental justice or protection of children would occur with implementation of the Proposed Action.	Only minimal impacts would result from implementation of Alternative 1; therefore, minority and low-income populations would not be disproportionately adversely impacted. Similarly, Alternative 1 would not cause adverse impacts in areas supporting or frequented by concentrated populations of children. Therefore, only negligible impacts with regard to environmental justice or protection of children would occur with implementation of this alternative.	Conditions would remain the same as existing conditions.

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## SECTION 3 AFFECTED ENVIRONMENT

This section describes relevant existing environmental conditions for resources potentially affected by implementation of the Proposed Action and identified alternatives. In compliance with NEPA, CEQ regulations, UFC 3 260-01, and 32 CFR 989, the description of the affected environment focuses on only those aspects potentially subject to impacts (AFCEA 2006).

In the case of the Proposed Action, the affected environment description is limited primarily to Tinker AFB and Oklahoma County. Resource descriptions focus on the following areas: air quality, water resources, biological resources, transportation and circulation, cultural resources, hazardous materials and wastes, visual resources, and safety.

### 3.1 Air Quality

#### 3.1.1 Definition of Resource

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the US Environmental Protection Agency (USEPA) under the Clean Air Act (CAA) for criteria pollutants, including: ozone ( $O_3$ ), carbon monoxide (CO), nitrogen dioxide ( $NO_2$ ), sulfur dioxide ( $SO_2$ ), particulate matter equal to or less than 10 microns in diameter ( $PM_{10}$ ) and 2.5 microns in diameter ( $PM_{2.5}$ ), and lead (Pb). NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare.

##### 3.1.1.1 Criteria Pollutants

Air quality is affected by emissions from stationary sources (e.g., industrial development) and mobile sources (e.g., motor vehicles). Air quality at a given location is a function of several factors, including the quantity and type of pollutants emitted locally and regionally, and the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, the presence or absence of inversions, and topography.

**Ozone.** The majority of ground-level (terrestrial)  $O_3$  is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds (VOCs), nitrogen oxides ( $NO_x$ ), and oxygen.  $O_3$  is a highly reactive gas that damages lung tissue, reduces lung function, and sensitizes the lung to other irritants. Although stratospheric  $O_3$  shields the earth from damaging ultraviolet radiation, terrestrial  $O_3$  is a highly damaging air pollutant and is the primary source of smog. As of June 2004, USEPA issued the final rule for 8-hour  $O_3$ , revising the 1-hour  $O_3$  NAAQS standard. The 8-hour standard is more protective of public health and more stringent than the 1-hour standard, and non-attainment areas for 8-hour  $O_3$  are now designated.

**Carbon Monoxide.** CO is a colorless, odorless, poisonous gas produced by incomplete burning of carbon in fuel. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

**Nitrogen Dioxide.** NO<sub>2</sub> is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO<sub>2</sub> may cause acute respiratory disease in children. Because NO<sub>2</sub> is an important precursor in the formation of O<sub>3</sub> or smog, control of NO<sub>2</sub> emissions is an important component of overall pollution reduction strategies. The two primary sources of NO<sub>2</sub> in the US are fuel combustion and transportation.

**Sulfur Dioxide.** SO<sub>2</sub> is emitted primarily from stationary source coal and oil combustion, steel mills, refineries, pulp and paper mills, and from non-ferrous smelters. High concentrations of SO<sub>2</sub> may aggravate existing respiratory and cardiovascular disease; asthmatics and those with emphysema or bronchitis are the most sensitive to SO<sub>2</sub> exposure. SO<sub>2</sub> also contributes to acid rain, which can lead to the acidification of lakes and streams and damage trees.

**Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>).** PM is a mixture of tiny particles that vary greatly in shape, size, and chemical composition, and can be comprised of metals, soot, soil, and dust. PM<sub>10</sub> includes larger, coarse particles, whereas PM<sub>2.5</sub> includes smaller, fine particles. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Sources of fine particles include all types of combustion activities (e.g., motor vehicles, power plants, wood burning) and certain industrial processes. Exposure to PM<sub>10</sub> and PM<sub>2.5</sub> levels exceeding current standards can result in increased lung- and heart-related respiratory illness. USEPA has concluded that finer particles are more likely to contribute to health problems than those greater than 10 microns in diameter.

**Airborne Lead (Pb).** Airborne Pb can be inhaled directly or ingested indirectly by consuming lead-contaminated food, water, or non-food materials such as dust or soil. Fetuses, infants, and children are most sensitive to Pb exposure, which has been identified as a factor in high blood pressure and heart disease. Exposure to Pb has declined dramatically in the last 10 years as a result of the reduction of Pb in gasoline and paint, and the elimination of Pb from soldered cans.

### 3.1.1.2 Clean Air Act Amendments

The Clean Air Act Amendments (CAAA) of 1990 place most of the responsibility to achieve compliance with NAAQS on individual states. To this end, USEPA requires each state to prepare a State Implementation Plan (SIP). A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all NAAQS. Areas not in compliance with a standard can be declared nonattainment areas by USEPA or the appropriate state or local agency. In order to reach attainment status, NAAQS may not be exceeded more than once per year. A nonattainment area can reach attainment when NAAQS have been met for a period of ten consecutive years. During this time period the area is in transitional attainment, also termed maintenance.

### 3.1.2 Existing Conditions

#### 3.1.2.1 Climate

Oklahoma County is located in the Interior Lowlands physiographic region. The County has two major land resource areas (MLRA): the eastern half of the county is in the Northern Cross Timbers MLRA and the western half is in the Central Rolling Red Prairies MLRA (U.S. Department of Agriculture [USDA] 2003). In winter, the average daily temperature is 38.6 degrees Fahrenheit (°F), and the average daily minimum temperature is 27.8°F. In summer the average temperature is 80°F, and the average daily maximum temperature is 91.1°F. The average annual precipitation is 33.35 inches. The majority of precipitation, 74 percent, usually falls from April through October; average seasonal snowfall is 9.1 inches. Prevailing winds blow from the south with the average speed of 14 miles per hour in March and April (USDA 2003).

#### 3.1.2.2 Local Air Quality

Oklahoma County is currently designated by the USEPA as an attainment area for carbon monoxide, sulfur dioxide and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). A five-year Ozone Early Action Compact for Oklahoma City was initiated and has been completed. During that time, Oklahoma City never required a nonattainment deferral from the USEPA. Currently the Association of Central Oklahoma Governments is developing an 8-hour ozone flex plan for Oklahoma City for the next five years, similar to the Early Action Compact. Ten air quality monitoring stations are located within Oklahoma County, including one CO monitoring station, one PM<sub>10</sub> monitoring station, two PM<sub>2.5</sub> monitoring stations, one SO<sub>2</sub> monitoring station, three ozone monitoring stations, and two NO<sub>2</sub> monitoring stations. According to USEPA AirData, concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and CO have not exceeded the primary NAAQS during the past 10 years (USEPA 2007). According to USEPA AirData, concentrations of ozone have exceeded the 8-hour NAAQS in the past 10 years (USEPA 2007). In addition to criteria pollutants, the Oklahoma Department of Environmental Quality (DEQ) Air Quality Division regulates incinerators, particulate matter, cotton gins, smoke, and odors (DEQ 2006a).

#### 3.1.2.3 Tinker AFB and Proposed Project Location

DEQ – which publishes regulations for air quality and permitting for all counties in Oklahoma – has jurisdiction over and regulates air emissions associated with Tinker AFB. Tinker AFB is located within Oklahoma County, which is in an Early Action Compact Agreement with USEPA for 8-hour ozone and in attainment for all other criteria pollutants.

Under the CAAA, the Title V Operating Permit Program imposes requirements for air quality permitting on air emission sources. Tinker AFB is categorized as a major source under the Title V program since its potential emissions from stationary sources exceed 100 tons per year (tpy) of any of the criteria pollutants, or 10 tpy of any single Hazardous Air Pollutant (HAP), or 25 tpy of any combination of HAPs. Also under the CAAA, the National Emission Standards for



Hazardous Air Pollutants (NESHAP) program specifies various provisions for regulated sources, including limits on HAP emissions, compliance demonstrations and performance testing, monitoring, record keeping, and reporting. The NESHAP program applies to Tinker AFB since potential emissions of any single HAP equals or exceeds 10 tpy and a combination of HAPs equals or exceeds 25 tpy. Tinker AFB maintains a Title V Air Permit (DEQ 2006b). Primary on-site emission sources at the Tinker AFB include:

- stationary combustion sources (boilers, water heaters, furnaces, gasoline and diesel-fuel generators, engine test cells);
- operational sources (chemical usage, paints, degreasers, abrasive blasting, welding operations, fuel cell maintenance, wastewater treatment, small arms firing range);
- fuel-storage/transfer operations (horizontal tanks, internal floating roof tanks); and
- mobile sources (vehicle operations, aircraft operations, trim and power checks, aerospace ground equipment [AGE]).

The proposed ATCT facility would be developed on property located in the general area of the existing Engine Hushhouse, B926, north of the existing Control Tower, in proximity to midfield. This location is approximately 1,750 feet west of the Runway 17/35 centerline and 7,500 feet east of the Runway 17 threshold. No activities or development occur on or adjacent to this property that generate emissions uncharacteristic of the base or regional environment.

## 3.2 Water Resources

### 3.2.1 Definition of Resource

Water resources analyzed in this EA include surface and groundwater resources, including the quality and availability of surface and groundwater, wetlands, and the potential for flooding. Surface water resources include lakes, rivers, and streams and are important for a variety of reasons including economic, ecological, recreational, and human health. Groundwater includes the subsurface hydrologic resources of the physical environment and is an essential resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) and USEPA as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. As defined in 1984, wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR 328.3 [b]). Wetlands provide a variety of functions including groundwater recharge and discharge, flood flow alteration, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, aquatic and terrestrial diversity and abundance, and uniqueness. Three criteria are necessary to define wetlands: vegetation (hydrophytes), soils (hydric), and hydrology (frequency of flooding

or soil saturation). *Hydrophytic vegetation* is classified by the estimated probability of occurrence in wetland versus upland (non-wetland) areas throughout its distribution. *Hydric soils* are those that are saturated, flooded, or ponded for sufficient periods during the growing season and that develop anaerobic conditions in their upper horizons (i.e., layers). Wetland hydrology is determined by the frequency and duration of inundation and soil saturation; permanent or periodic water inundation or soil saturation is considered a significant force in wetland establishment and proliferation. Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act (CWA); Executive Order (EO) 11990, *Protection of Wetlands*, requires analyses of potential impacts to wetlands related to proposed federal actions.

Other issues relevant to water resources include watershed areas affected by existing and potential runoff and hazards associated with 100-year floodplains. Floodplains are belts of low, level ground present on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by flood water. Inundation dangers associated with floodplains have prompted federal, state, and local legislation that limits development in these areas largely to recreation and preservation activities. EO 11988, *Floodplains Management*, requires actions to minimize flood risks and impacts. Under this order, development alternatives must be considered and building requirements must be in accordance with specific federal, state and local floodplain regulations.

### **3.2.2 Existing Conditions**

#### **3.2.2.1 Regional Setting**

##### **Surface Water**

Oklahoma County's landforms drain into the North Canadian River. The northern portion of the County drains into the Crutcho Creek Drainage Basin and into the North Canadian River, and the southern portion drains into the Elm Creek and Hog Creek Drainage Basins and into the South Canadian River, both of which are headwaters for the Arkansas-Mississippi River Basin. The North Canadian River runs west to east through Oklahoma County. The entire County is part of the Arkansas River Basin (U.S. Fish and Wildlife Service [USFWS] 2006a).

Several drainage corridors traverse Oklahoma County close to Tinker AFB, including Brock Creek, East Elm Creek, Crutcho Creek, West Hog Creek, East and West Forks of Wildhorse Creek, Bluff Creek, Walnut Creek, and Soldier Creek. Surface waters occur in three main stream systems, one which drains to the north (Crutcho Creek with Kuhlman and Soldier Creek tributaries) and two to the south (East Elm Creek and West Hog Creek). The north-flowing stream system originates approximately two miles south of Tinker AFB's current southern boundary with on-base portions of the system comprising 12 smaller, first-order tributaries; two larger, second-order tributaries; and one main, third-order tributary. The south-flowing systems consist of only first- and second-order tributaries with higher-order tributaries located off base

land. Several other minor creeks and draws feed into the above-mentioned major creeks (Oklahoma Water Resources Board [OWRB] 2006).

### **Groundwater**

Aquifers which underlie Oklahoma County include both ephemeral (short-lived) and perennial (lasting the entire year) aquifers. The most important source of potable groundwater in the Oklahoma City metropolitan area is the Central Oklahoma Aquifer system. This aquifer extends under much of central Oklahoma and includes water in the Garber Sandstone and Wellington Formation, the overlying alluvium and terrace deposits, and the underlying Chase, Council Grove, and Admire Groups. The Garber Sandstone and the Wellington Formation portion of the Central Oklahoma Aquifer system is referred to commonly as the “Garber-Wellington Aquifer” and is considered to be a single aquifer because these units were deposited under similar conditions. Many of the best producing water wells are completed in this zone. On a regional scale, the aquifer is confined above by the less permeable Hennessey Group and below by the Late Pennsylvanian Vanoss Group. The regional dip of these formations is generally to the west (Parkhurst et al. 1993).

Tinker AFB lies within the recharge area of the Garber-Wellington Aquifer. The direction of the regional water table gradient under Tinker AFB is reported to range generally from west/northwest to southwest, depending on location, and has a magnitude ranging from 10 to 30 feet per mile (Christenson et al. 1992). However, determination of horizontal gradients is made difficult by the presence of a downward component of flow in the Garber-Wellington Aquifer. Both direction and magnitude of groundwater flow can be highly variable, both spatially and temporally, due to local variations in geology, sources of recharge, and the interaction between the shallow aquifer and streams. This aquifer is recharged primarily by infiltration of rainfall or surface water through fractures in the Fairmont Shale and directly into the Garber Sandstone (OWRB 2006).

Across the county, water can sometimes be found in shallow, thin, discontinuous perched zones located above the aquifer. Most water from the Garber-Wellington aquifer is of sufficient quality to be used for most industrial, agricultural, and domestic purposes.

Industrial operations, individual homes, farm irrigation, and small communities not served by a municipal distribution system also depend on the Garber Wellington Aquifer. Communities presently depending on surface supplies, such as Oklahoma City, Midwest City, and Del City, maintain wells tapping the Garber-Wellington Aquifer as a backup water supply in the event of drought.

### **Wetlands**

Wetlands represent approximately two percent of the land area in Oklahoma (USEPA 2006). Several wetlands are located in Oklahoma County; National Wetland Inventory (NWI) maps for the area indicate that these wetlands are primarily freshwater emergent, freshwater forested/shrub, freshwater pond, and riverine (USFWS 2006a).

### **Floodplains**

Flood hazard areas of Oklahoma County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect public health, safety and general welfare. The bulk of Federal Emergency Management Agency (FEMA) designated floodplains, 100-year and 500-year, for Oklahoma County exist along the North Canadian River and its tributaries (OWRB 2006).

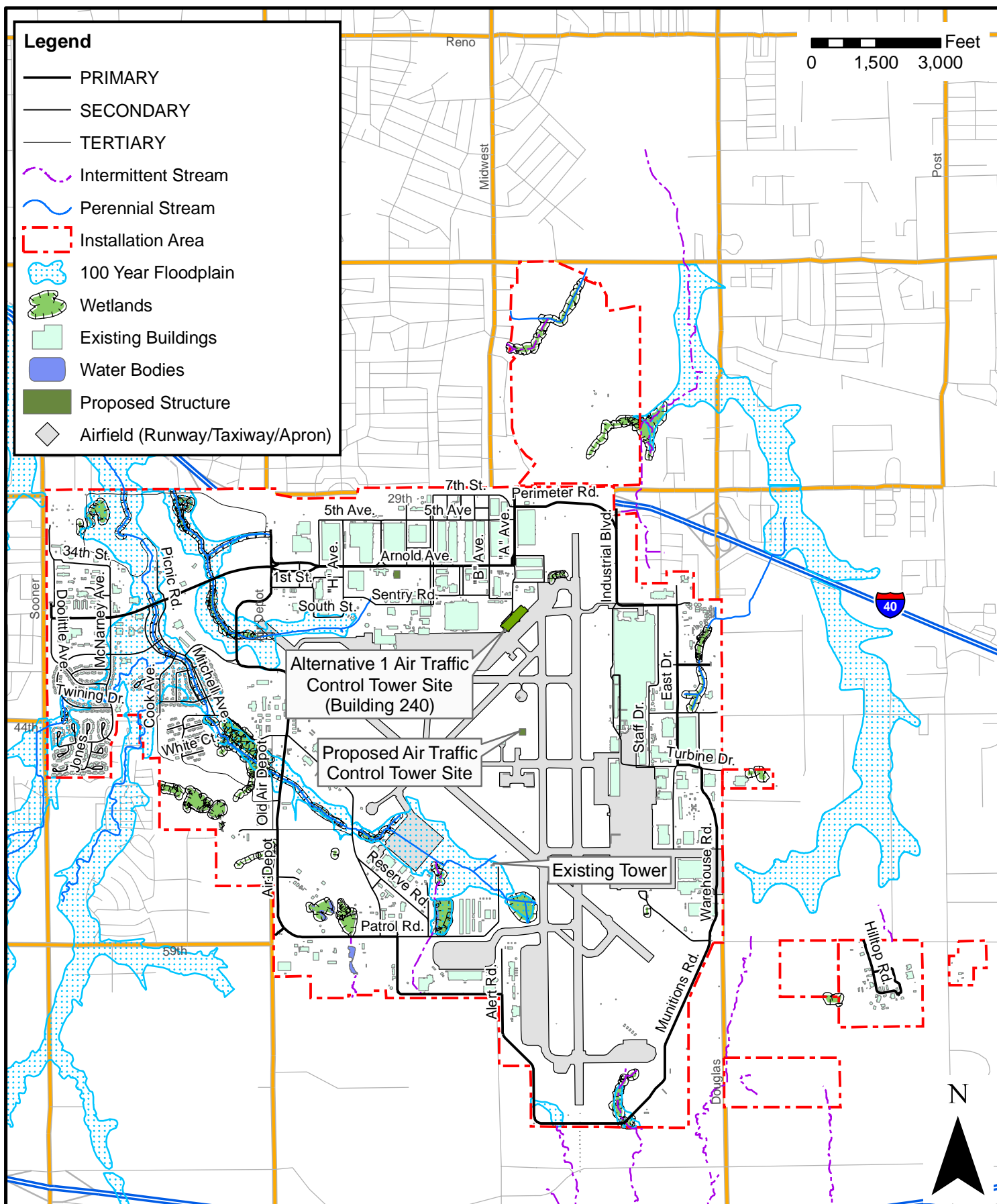
The Floodplain Board of Oklahoma County appoints a county floodplain manager who administers and implements regulations and other appropriate sections of 44 CFR (National Flood Insurance Program Regulations) pertaining to floodplain management. The duties and responsibilities of the floodplain board are to adopt, administer and enforce floodplain management regulations which: (a) delineate floodplains and floodways, and delineate 100-year flood elevations within all unincorporated areas of the County (these delineations shall be submitted to the OWRB); (b) preserve the capacity of the floodplain to carry and discharge regional floods; (c) minimize flood hazards; and (d) regulate the use of land in the floodplain (OWRB 2006).

#### **3.2.2.2 Tinker AFB and Proposed Project Location**

### **Surface Water**

Surface drainage at Tinker AFB occurs in three primary drainage basins: 1) Crutcho Creek Drainage Basin, 2) Elm Creek Drainage Basin, and 3) Hog Creek Drainage Basin. These are further divided into 10 sub-basins or watersheds. The majority of land associated with Tinker AFB is drained by the Crutcho Creek Drainage Basin which flows to the north into the North Canadian River. The Elm Creek and Hog Creek Drainage Basins flow to the south of the base into the Little River which forms confluences with the South Canadian River (Tinker AFB 2007a).

On-base, open-flowing waters comprise a total of about eight linear miles. The first- and second-order segments are typically ephemeral or intermittent while the third-order segment is perennial. All base creek flows are the result of stormwater runoff (Tinker AFB 2007a). Stormwater runoff is collected by various diversion structures and discharged to surface streams. Approximately 5 miles of stream channels within Tinker AFB lie within 100-year floodplains (Figure 3-1) (USAF 1991).



EA

**Wetlands, Waterbodies, and Floodplains  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

**FIGURE  
3-1**

This action eliminated flows of 1.3 million gallons per day to the on-base portion of Soldier Creek (i.e., East Soldier Creek) (Tinker AFB 2007a).

### **Groundwater**

The direction of groundwater flow under Tinker AFB varies. There is an apparent groundwater divide associated with Crutch Creek that affects shallow groundwater flow direction. Regional topographic lows draw portions of groundwater in the area southwestward, while other areas flow northward toward discharge points along Crutch Creek (Tinker AFB 2001).

Throughout much of the northern half of the base, the Garber-Wellington Aquifer is not protected by any confining shale. In the southern half of the base, the Hennessey Group overlies the Aquifer and acts as a confining layer because it is comprised predominately of clay-rich, low-permeability shale. The confining nature of the Hennessey Group causes rainfall to remain near ground surface and flow laterally until it discharges to streams. The groundwater system at Tinker AFB has been divided into five hydrogeologic zones: the Hennessey Water Bearing Zone, the Upper Saturated Zone (USZ), the Lower Saturated Zone (LSZ), the Lower-Lower Saturated Zone (LLSZ), and the Production Zone (PZ). The USZ and LSZ are regionally considered to be in the upper third of the Garber-Wellington Aquifer, and generally are present at depths of less than 200 feet below ground surface (bgs). The LLSZ is considered the lower half of the LSZ. The PZ generally is considered to be greater than 200-feet bgs. Generally, municipal wells are completed below the 200 foot depth on and around Tinker AFB and are used for water supply at Tinker AFB and off-base locations (Tinker AFB 2001). Tinker AFB is located in a recharge area for these water-bearing zones; groundwater is derived primarily from precipitation and from infiltration of surface streams.

Groundwater at Tinker AFB is found under either water table or confined conditions. The depth to water ranges from a few feet to about 70 feet bgs depending on the local topography. Across Tinker AFB, water can sometimes be found in shallow, thin, discontinuous perched zones located above the Aquifer. However, some contaminated groundwater plumes do exist on Tinker AFB, typically at a depth of 175 feet or shallower. This does not pose health concerns at this time since the producing zone (i.e., depth at which water from supply wells is obtained) at Tinker is 200 feet or deeper. Also, there appears to be an aquitard at approximately 200 feet which hydraulically separates the deeper producing zone from shallower groundwater in the aquifer at Tinker AFB (Tinker AFB 2001).

The approximate direction of groundwater flow in the Garber-Wellington Aquifer is south and southwest across the southern half of the base and west to northwest across the northern half. Shallow groundwater may discharge to surface streams (gaining stream) or be recharged by streams (losing stream) (OWRB 2006). Both situations occur at Tinker AFB along Crutch Creek and Soldier Creek. In contrast, water in the Hennessey Water Bearing Zone generally flows to the northeast toward Crutch Creek from higher topographic areas along the south boundary of the base (Tinker AFB 2002a).

## **Wetlands**

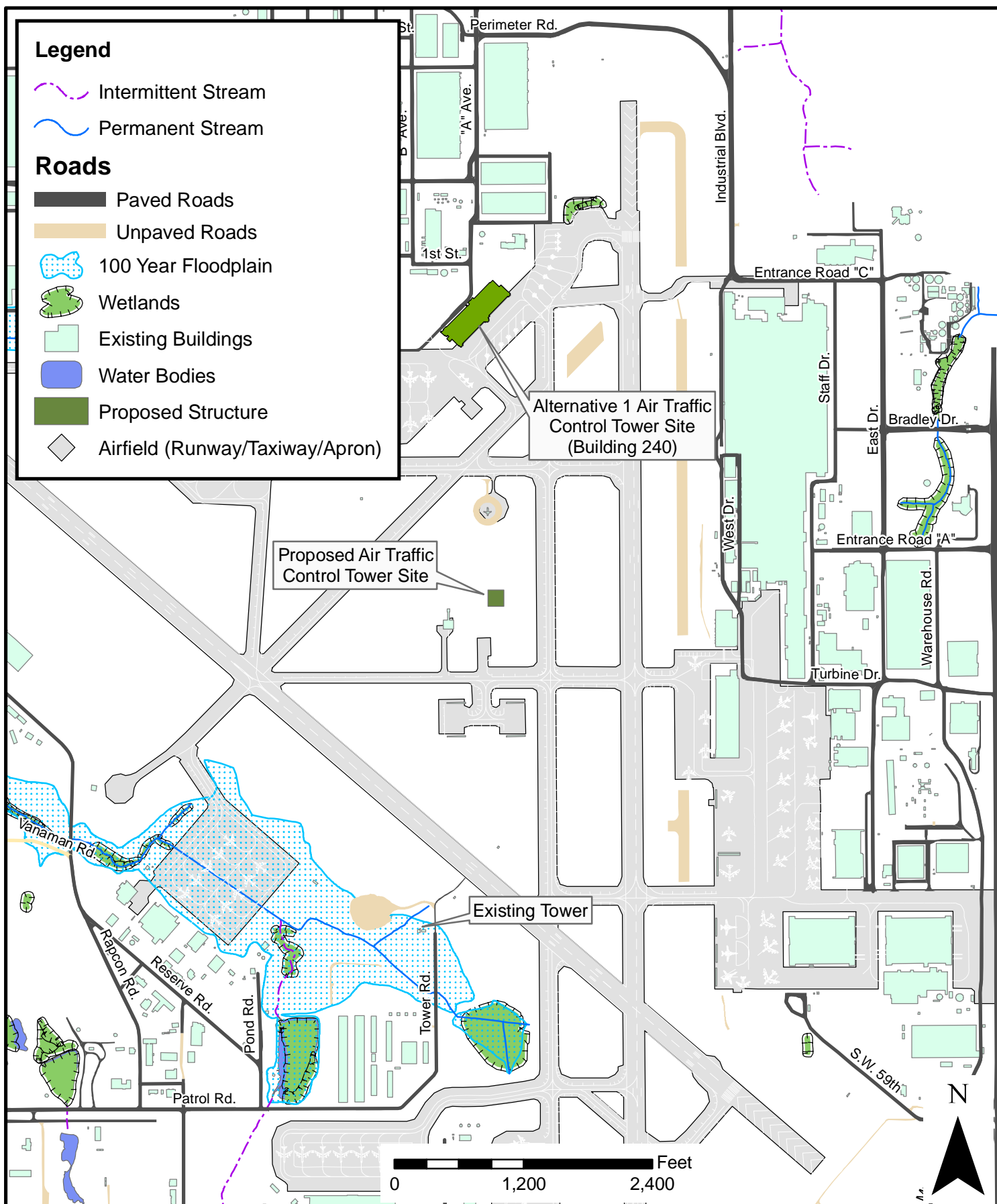
In 1995, approximately 65 acres of wetlands were identified on Tinker AFB by USFWS using NWI criteria; these wetlands included creeks, ponds, drainage swales, and other wet areas. Of the 65 acres, 7.9 acres were later classified by the USACE as jurisdictional wetlands under the CWA. The 7.9 acres were divided among five wetland areas: Ground Water Treatment Plant (GWTP) wetland (0.5 acres); Fuel Control Facility wetland (0.8 acres); Greenway wetland (4.8 acres); Compressed Natural Gas (CNG) wetland (0.3 acres); and the Glenwood wetland (1.5 acres, on-base portion only). This excluded the off-base portion (8.5 acres) of the Glenwood wetland which was located immediately adjacent to and east of the base on county and private land (Tinker AFB 2007a). In 2002, these 65 acres (73 individual wetland areas) were reassessed to track their status and trend (Tinker AFB 2007a). Based on the survey, only two wetlands (i.e., Greenway and Prairie Pond) were classified as high quality wetlands. Thirty-four were classified as intermediate quality, and six as low quality. This study also determined that 31 of the original 73 NWI wetland areas no longer existed or were actually drainage ditches or wet-weather conveyances that did not function as wetlands or aquatic habitat and therefore were not included in the survey. These non-wetland areas covered approximately 27 acres, and most were within the airfield or other highly industrialized areas of the base. Therefore, the current total NWI acreage on Tinker AFB is estimated at 38 acres. These have not been officially “delisted” as wetlands by the USFWS who conducted the original study (Tinker AFB 2007a).

In 1999, the Glenwood wetland was drained because it attracted waterfowl which presented a bird/wildlife-aircraft strike hazard (BASH). This reduced the total on-base wetland acreage to 6.4 acres. Mitigation for the Glenwood wetland removal included the construction of wetlands in the cities of Choctaw (two wetlands totaling 2.3 acres) and McCloud (3 acres), Oklahoma; Eagle Ridge Institute in Oklahoma City (3 acres); and at the Kids-We-Care site (three wetlands totaling 10 acres) south of Guthrie, Oklahoma (mitigation acreages are approximated [Tinker AFB 2007a]).

All jurisdictional wetlands on Tinker AFB were man-made with the exception of the Glenwood wetland, which was created by beaver activity. The GWTP wetland is located on a Superfund site and therefore is regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by the USEPA. The vegetation and soils of the GWTP wetland were removed in 1999 as part of a Soldier Creek remediation effort (Tinker AFB 2005a).

Recent discussions and correspondence with USACE determined that the Fuel Control Facility wetland was not within the jurisdiction of the USACE (Tinker AFB, 2007c). The wetland likely provides some flood control and water cleansing functions to East Soldier Creek as stormwater from nearby urbanized landscapes filters through the wetland prior to entering the Soldier Creek drainage.

No wetlands are located on or near either the Proposed Action site or the Alternative 1 location (Figure 3-2).



EA

**Wetlands, Waterbodies, and Floodplains  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

**FIGURE  
3-2**



## **Floodplains**

In October 2002, USACE, Southwestern Division-Tulsa District, completed a study for Tinker AFB to update the 100-year and 500-year floodplains. The 100-year and 500-year floodplains were reassessed for the Middle Branch, Upper Crutcho Creek (the Eastern Branch), and Upper Crutcho Creek (Western Branch) (USACE 2002). Crutcho Creek and its tributaries and Kuhlman Creek are bounded by 100-year and 500-year floodplains designated by FEMA. These floodplains affect approximately 520 acres of base land (Figure 3-2) (Tinker AFB 2007b). The bulk of these floodplains are located along Crutcho Creek. However, no FEMA-designated floodplains exist along the smaller, intermittent streams that exist on the base (USACE 2002). No 100- or 500-year floodplains have been designated on the Proposed Action site or Alternative 1 location (Figure 3-2). However, the current ATCT facility, B935, is located in a designated 100-year floodplain.

## **3.3 Biological Resources**

### **3.3.1 Definition of Resources**

Biological resources include native or naturalized plants and animals and the habitats in which they occur. Sensitive biological resources are defined as those plant and animal species listed as threatened or endangered, candidate, rare, and other sensitive flora and fauna, or proposed as such, by the USFWS and respective State agencies. Federal and State Species of Concern are not protected by law; however, these species could become listed or protected at any time if not properly managed. Threatened and endangered species are federally protected plants and animals that are in danger of becoming extinct without protection. These species may be rare because of specialized habitat needs or habitat destruction. The ESA of 1973 protects listed species against killing, harming, harassment, or any action that may damage their habitat.

### **3.3.2 Existing Conditions**

#### **3.3.2.1 Regional Setting**

The landscape of Oklahoma County is characterized by level to gently rolling hills, broad flat plains and bottomlands intersected by small to medium sized watercourses. The County is part of the Cross Timbers Vegetation Area of the Midwest and the Central Oklahoma/Texas Plains or Central Great Plains (Tinker AFB 2001).

## **Vegetation**

The original vegetation cover in the central Oklahoma uplands consisted of mixed forests and woodlands interspersed with areas of open grasslands. These original plant communities have been radically altered through development, deforestation, intensive agriculture, and the introduction of invasive species (Tinker AFB 2001). However, many smaller portions of these vegetative communities still comprise Oklahoma County's vegetation. Upland forests integrated with woodlands and prairie comprise Oklahoma County's primary vegetation community.

Intermixed in this community are woodlands of oaks, upland forests of deciduous or evergreen trees, and grasslands intermixed with blue grama (*Bouteloua gracilis*), buffalo grass (*Bouteloua dactyloides*), and non-native grasses (Hoagland 1999). The County's vegetative community also includes riparian areas adjacent to streams, drainage channels, and in low-lying areas where water availability is relatively greater than the surrounding landscape (Tinker AFB 2002a).

Much of the native vegetative communities associated within Oklahoma City and the Tinker AFB area has been replaced with developed landscape and ornamental and non-native vegetation (University of Oklahoma [OU] 2006).

### **Wildlife**

Approximately 350 native vertebrate species and a much greater unknown number of invertebrates have historically occurred either in the Central Oklahoma/Texas Plains or Central Great Plains Ecoregions (Oklahoma Department of Wildlife Conservation [ODWC] 2007). Some species that probably occurred on this land during pre-settlement times include prairie dogs, bear, bison, wolves, elk, and horses. Numerous other species have been displaced by urban and industrial activities on and around Tinker AFB.

Six species are federally listed as threatened or endangered in Oklahoma County by USFWS (Table 3-1). The State of Oklahoma has an endangered species act for plants and animals; species listed on the federal list correspond with those on the state list (Oklahoma Natural Heritage Inventory [ONHI] 2003).

**Table 3-1 Special Status Plant and Animal Species of Oklahoma County**

Scientific Name	Common Name	State Status <sup>1</sup>	Federal Status <sup>1</sup>
<b>Birds</b>			
<i>Haliaeetus leucocephalus</i>	Bald Eagle	T, Delisted <sup>2</sup>	T, Delisted <sup>2</sup>
<i>Vireo atricapillus</i>	Black-Capped Vireo	E	E
<i>Sterna antillarum</i>	Least Tern	E	E
<i>Charadrius melodus</i>	Piping Plover	T	T
<i>Grus americana</i>	Whooping Crane	E	E
<i>Tyto alba</i>	Barn Owl	CS, SS2	
<i>Buteo swainsoni</i>	Swainson's Hawk	SS2	
<i>Athene cunicularia</i>	Burrowing Owl	SS2	
<i>Lanius ludovicianus migrans</i>	Migrant Loggerhead Shrike	SS2	
<b>Fish</b>			
<i>Notropis girardi</i>	Arkansas River Shiner	T	T

894 **Table 3-1 Special Status Plant and Animal Species of Oklahoma County (Continued)**

Scientific Name	Common Name	State Status <sup>1</sup>	Federal Status <sup>1</sup>
<b>Mammals</b>			
<i>Marmota monax</i>	Woodchuck	SS2	
<b>Reptiles</b>			
<i>Phrynosoma cornutum</i>	Texas Horned Lizard	SS2	
<b>Plants</b>			
<i>Penstemon oklahomensis</i>	Oklahoma Penstemon	S3	

<sup>1</sup>Legal Status:

- E – Endangered
- T – Threatened
- CS – Statewide closed season (state ranking). It is unlawful at any time to possess or to kill individuals of these species or to remove any individuals of these species from their natural habitats.
- SS2 – Species of Special Concern (state ranking). These species have been identified by technical experts as possibly threatened of extirpation but for which additional information is needed.
- S3 – Rare and local in Oklahoma (though it may be abundant at some of its locations); in the range of 21-100 occurrences.

<sup>2</sup>Bald Eagle delisted from threatened status by USFWS on June 28, 2007.

Sources: USFWS 2007; Tinker AFB 2007a.

### 906 3.3.2.2 Tinker AFB and Proposed Project Location

#### 907 Vegetation

908 The area now occupied by Tinker AFB was historically dominated by tall and/or mixed grass  
 909 prairie (Tinker AFB 2007a). Less than 2 percent of the pre-settlement prairie ecosystem  
 910 currently remains on Tinker AFB. No pristine native prairie or bottomland areas are present on  
 911 the installation. Only a few small, fragmented prairie remnants, less than 100 acres total, remain,  
 912 and these are in degraded condition. Much of the original prairie was farmed as evidenced by  
 913 remaining terraces at numerous locations on the base (Tinker AFB 2002a). Approximately half  
 914 of the Tinker AFB land area (2,620 acres) has been developed for buildings, roads, pavement,  
 915 railroads, and other structures. About 20 percent of the current land area (1,036 acres) is  
 916 periodically maintained grounds (i.e., semi-improved grounds) such as the airfield.  
 917 Approximately 14 percent of the land (700 acres) is highly maintained grounds (i.e., improved  
 918 grounds) such as lawns, athletic fields, and a golf course. The remaining 14 percent (684 acres)  
 919 is not maintained (i.e., unimproved grounds), and includes areas such as the Urban Greenway  
 920 and Glenwood areas (Tinker AFB 2001). Seven vegetation types (including 31 vegetation  
 921 communities with in those vegetation types) are found at Tinker AFB (Tinker AFB 2007a):

- 922 • Grassland – Characteristic of a native mid-grass prairie;
- 923 • Field – Successional stage of native and/or exotic species of grasses and forbs;
- 924 • Forest/Woodland – Close stand (forest) or open growth (woodland) in a natural area;

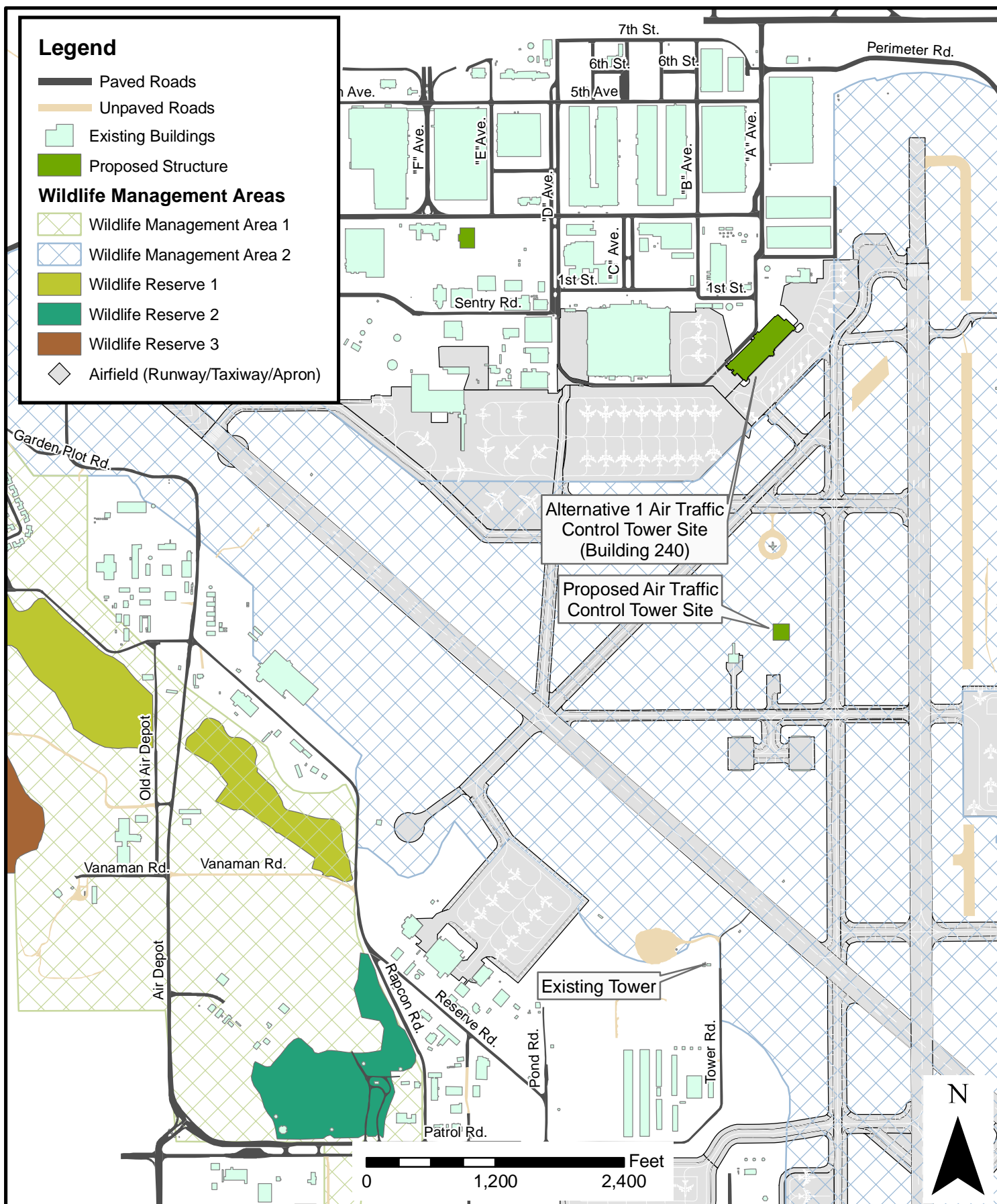
- Transitional Forest/Woodland – Successional stage of native and/or exotic trees configured in a close (forest) or open (woodland) stand, primarily in previously disturbed areas;
- Urban/Industrial – Dominated by turf grass, associated forbs, and ornamental herbaceous and woody plants;
- Transitional Urban/Industrial – Indigenous and exotic plants with a predominance of ornamental vegetation; and
- Wetland/Marsh – Dominated by mesophytes (plants growing under medium moisture conditions) and/or hydrophytes (plants growing under high moisture conditions) and located in areas temporarily or permanently inundated.

Within the areas that have been converted to urban and industrial use, the plant community is comprised primarily of turf grasses and ornamental trees and shrubs. The predominant turfgrass on Tinker AFB is Bermuda grass. Native buffalo grass is often found mixed with Bermuda grass. Other more rural areas are typically a mixture of exotic and native plants. Trees and shrubs are composed of native and exotic plants, and, contrary to pre-settlement plant distribution, many woody plants are found on upland as well as bottomland sites (Tinker AFB 2001).

### **Wildlife**

Wildlife at the site proposed for the Control Tower is limited to those species adapted to high levels of human activity and disturbance. Tinker AFB is classified as a Category 1 installation, as defined in AFI 32-7064, *Integrated Natural Resources Management*, meaning that suitable habitat for conserving and managing fish and wildlife exists (Tinker AFB 2007a). The available habitat includes movement corridors (e.g., riparian zones along creeks) and pockets of undeveloped acreage surrounded by urbanized land (USAF 1991) (Figure 3-3). The results of a 1990 reconnaissance survey indicated that approximately 1,800 acres were suitable or potentially suitable as wildlife habitat (USAF 1991). Included in this estimate were approximately 400 improved acres (military family housing and golf course), 600 semi-improved acres (mostly airfield), and 800 unimproved acres.

Common mammalian species found on Tinker AFB include fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), beaver (*Castor canadensis*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), deer mouse (*Peromyscus maniculatus*), hispid cotton rat (*Sigmodon hispidus*), black-tailed jackrabbit (*Lepus californiscus*), and opossum (*Didelphis virginianus*) (USACE 1995; Tinker AFB 2007). Resident bird species include mourning dove (*Zenaidura macroura*), barn swallow (*Hirundo rustica*), red-winged blackbird (*Agelaius phoeniceus*), meadowlark (*Sturnella* spp.), scissor-tailed flycatcher (*Tyrannus forficatus*), great-horned owl (*Bubo virginianus*), and bobwhite quail (*Colinus virginianus*). Several reptile and amphibian species are commonly found at Tinker AFB. These include Texas



EA

**Wildlife Management Areas  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

**FIGURE  
3-3**

horned lizard (*Phrynosoma cornutum*), ringneck snake (*Diadophis punctatus*), three-toed box turtle (*Terrapene carolina*), and bullfrog (*Rana catesbeiana*). The results of fish surveys at Tinker AFB indicate that 23 species of fish occur on base. Five species occur in ponds on the base while 18 species of fish occur in those portions of Crutcho, Kuhlman, and Soldier Creeks that are located on Tinker AFB (Tinker AFB 2002a). Some ponds on the facility have been stocked with fish including catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and fathead minnows (*Pimephales promelas*).

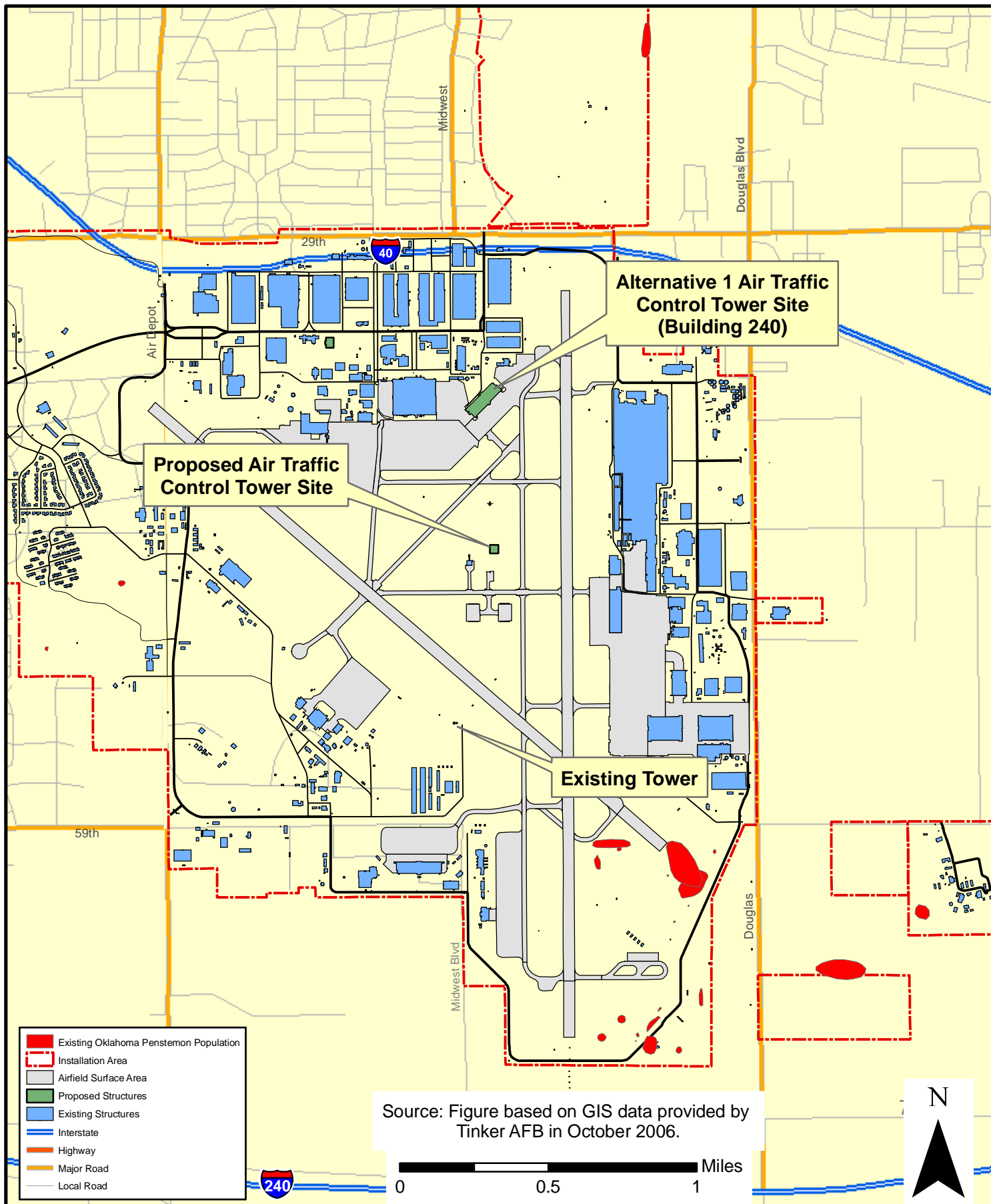
The location proposed for the ATCT and the Alternative 1 location consist of one general habitat type: field. The field likely provides habitat for species typical of grasslands that can also tolerate disturbed urbanized habitats, such as deer mouse, cottontail, and meadowlark (Figure 3-3).

### **Threatened and Endangered Species**

Field surveys were conducted at Tinker AFB during 1993 and 1994 to identify federally listed endangered or threatened species (USACE 1995) or state designated sensitive species (Johnson et al. 1995). No federal or state-listed threatened or endangered species were found during this survey or documented on other occasions on Tinker AFB (USACE 1995; Tinker AFB 2007a). However, the Oklahoma penstemon (*Penstemon oklahomensis*), which is classified as rare under the ONHI, has been documented at numerous locations on Tinker AFB (Figure 3-4) (Tinker AFB 2007a). The ONHI lists the species as G3S3 (restricted range) (ONHI 2003).

One federally listed species is known to be a seasonal resident of the local area, the whooping crane (*Grus americana*). The nearest known sightings are around Lake Arcadia and Lake Thunderbird (approximately 9 miles and 22 miles from Tinker AFB, respectively). It is unlikely these species would forage along creeks and open areas adjacent to the proposed project site, as these habitats are generally urban and of poor quality for the subject species (Tinker AFB 2002a). Base-wide surveys for the black-capped vireo (*Vireo atricapilla*) were conducted in 1993 and 1994, and none were sighted during these surveys (Tinker AFB 2002a).

Three state special concern species were found within Tinker AFB during this survey. These include Texas horned lizard (*Phrynosoma cornutum*), barn owl (*Tyto alba*), and loggerhead shrike (*Lanius ludovicianus*). It is not known whether the loggerhead shrikes observed were the migrant race (*migrans*). Burrowing owl (*Athene cunicularia*) and Swainson's hawk (*Buteo swainsoni*), both state species of special concern, have also been documented within Tinker AFB (Tinker AFB 2007a). The USFWS defines species of concern for the future well-being of the species, but the species does not receive any protection under the ESA. AFI 32-7064, *Integrated Natural Resources Management*, states that species having such a status should be considered in future planning and facility siting as well as provided protection wherever possible. The state special concern species identified at Tinker AFB are discussed below.



EA

# **Oklahoma Penstemon General Locations Construction of Air Traffic Control Tower Tinker Air Force Base**

FIGURE

3-4

1001 **Texas Horned Lizard.** Texas Horned Lizards range from the South-Central U.S. to Northern  
1002 Mexico (Texas Parks and Wildlife [TPW] 2000). They occur in open areas with sparse to  
1003 slightly more dense plant cover with corridors of sparse vegetation, in arid and semiarid habitats  
1004 in Oklahoma. They primarily eat ants. The species has been documented in sparsely vegetated  
1005 grassland areas in the southwest corner of Tinker AFB with isolated observations in the southeast  
1006 and northern areas of the base (Tinker AFB 2007a). Sparsely vegetated areas within the  
1007 proposed project site are quite limited. The species could possibly, but not likely, occur in these  
1008 areas.

1009 **Barn Owl.** The barn owl is found throughout most of the United States and is a rare resident of  
1010 most of Oklahoma. It usually occupies relatively open areas, such as prairies, meadows, and  
1011 marshes. The barn owl nests and roosts in buildings, cliffs and trees. The diet of the owl  
1012 consists primarily of rodents or small birds, and occasionally insects (Oberholser 1974). Barn  
1013 owls have been observed in northeastern portions of Tinker AFB in the Glenwood area (USAF  
1014 1991).

1015 **Swainson's Hawk.** Swainson's hawk occurs throughout the Tinker AFB on relatively open  
1016 lands and has historically nested along Kuhlman Creek south of the golf course (Tinker AFB  
1017 2007a).

1018 **Burrowing Owl.** Burrowing owls inhabit grasslands and are frequently associated with prairie  
1019 dog colonies. They have been observed on the airfield and in Reserve 3 of the Urban Greenway  
1020 in winter (Tinker AFB 2007a). The species is believed to be a winter visitor to Tinker AFB, and  
1021 no nests have been documented.

1022 **Oklahoma Penstemon.** Oklahoma Penstemon is found only in Oklahoma but is very abundant  
1023 at numerous locations within Oklahoma (ONHI 2003). It is found in prairies, oak savannas,  
1024 abandoned fields, and along roadsides (Johnson et al. 1995). The penstemon is located in  
1025 fragmented remnant native prairie communities, primarily in the southeast portion of the base to  
1026 include the airfield, Engineering Installation Group (EIG), and Douglas Field. Other small  
1027 populations occur in the northeastern portion of Glenwood and at the Fuel Control Facility  
1028 (Tinker AFB 2007a) (Figure 3-4).

1029 All DoD installations are required to perform a threatened and endangered species survey prior  
1030 to any activities that disturb habitat that potentially supports such species. However, there are no  
1031 threatened or endangered species known to occur in the immediate vicinity of the proposed  
1032 Control Tower site. Furthermore, no designated critical habitat or wilderness areas are located  
1033 on or in the immediate vicinity of the base (USFWS 2006b & 2006c). Further information  
1034 summarizing special status species potentially found at the proposed project site is included in  
1035 Table 3-2.



**Table 3-2 Special Status Species Potentially Occurring on the Proposed Action and Alternative 1 Site**

Scientific name Common Name	Status	Habitat Requirements	Habitat	Range	Presence at Proposed Location
<b>Federally Listed Species</b>					
<i>Charadrius melodus</i> (Piping plover)	T	Sand/gravel areas on lakes, river, and ponds	U	C	UN
<i>Haliaeetus leucocephalus</i> (Bald eagle)	D, T	Trees or cliffs near water; oceans, rivers or lakes	U	C	UN
<i>Grus Americana</i> (Whooping crane)	E	Marshes	U	Mi	UN
<i>Sterna antillarum athalassos</i> (Interior least tern)	E	Islands/sandbars in large rivers; sandy areas, shallow water	U	C	UN
<b>State Special Concern Species</b>					
<i>Athene cunicularia</i> (Burrowing owl)	SS2	Grasslands, prairie dog colonies	M	C	PO
<i>Buteo swainsoni</i> (Swainson's hawk)	SS2	Plains, range, open hills, sparse trees	M	C	PO
<b>State Special Concern Species</b>					
<i>Lanius ludovicianus migrans</i> <sup>1</sup> (Migrant loggerhead shrike)	SS2 SC	Open country with scattered trees, scrub, deserts, roadsides	S	C	PO
<i>Phrynosoma cornutum</i> (Texas horned lizard)	CS SS2 SC	Semi-arid open country with sparse plant growth	M	C	PO
<i>Tyto alba</i> (Barn owl)	SS2	Feeds in grasslands; nests in caves, trees, and buildings	S	C	UN
<b>ONHI</b>					
<i>Penstemon oklahomensis</i> Oklahoma penstemon	G3S3	Prairies, oak savannas, abandoned fields, and along roadsides	S	C	PO

Sources: ODWC 2007; USAF 1991; Tinker AFB 2007a.

Key:

Status Codes\*

E Federally and State Endangered

T Federally and State Threatened

SC Federal Species of Concern (Former C2 Candidates, list no longer maintained by USFWS)

CS Statewide Closed Season

SS2 State Special Concern Category II

G3 Rare globally

S3 Rare and local in Oklahoma (may be locally abundant)

\*Federally listed endangered or threatened species are automatically included on Oklahoma's state list in the same category

Habitat Codes

Range Codes

Presence Codes

S Suitable H Historic UN Unlikely

M Marginal C Current PO Possible

U Unsuitable Mi Migratory V Verified (in the immediate vicinity of proposed ATCT)

P Periphery

Notes:

<sup>1</sup>Loggerhead shrikes have been documented on Tinker AFB. It is unknown whether the migrant race occurs (Tinker AFB 2007a).

All species listed by USFWS 2002 as occurring in Oklahoma County were included in table.

State sensitive species include those species that have been documented on Tinker AFB according to Tinker AFB 2007a.

### **3.4 Transportation and Circulation**

#### **3.4.1 Definition of Resource**

Transportation and circulation refer to the movement of vehicles throughout a road and highway network. Primary roads are principal arterials, such as major interstates, designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads are arterials such as rural routes and major surface streets which provide access to residential and commercial areas, hospitals, and schools.

#### **3.4.2 Existing Conditions**

##### **3.4.2.1 Regional and Local Circulation**

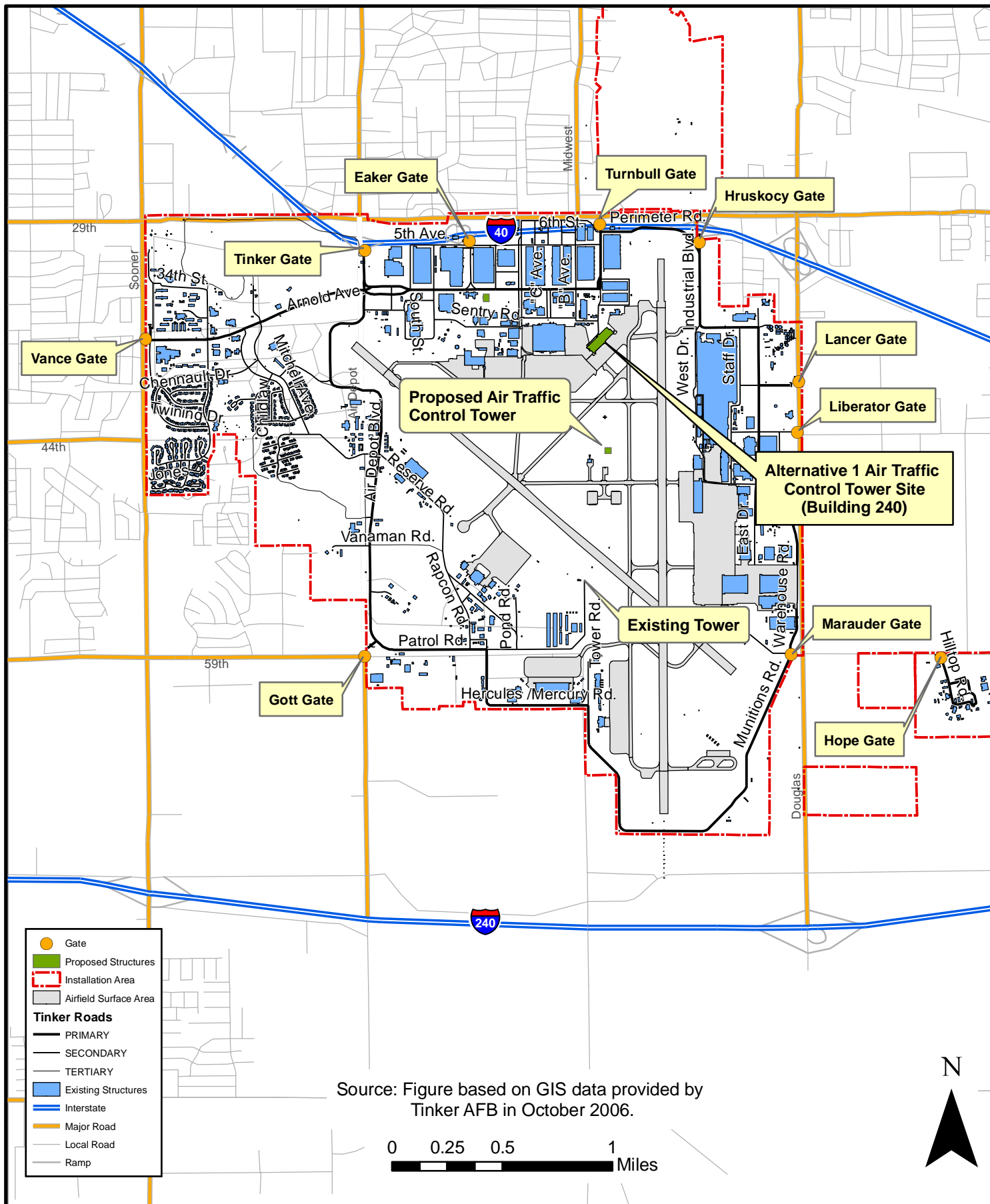
Tinker AFB is located within the city limits of Oklahoma City, approximately 9 miles, by surface roads, southeast of downtown. Oklahoma City is served by a network of interstates and local and regional arterial roads. Four interstates, I-40, I-35, I-240, and I-44, pass through Oklahoma City and provide regional access to the base.

Three arterial roads, including Sooner Road, Southeast 29<sup>th</sup> Street, and Douglas Boulevard, and two interstates, I-40 and I-240, provide local access to Tinker AFB. Sooner Road is a north-south, four-lane arterial that forms part of the western border of the base. Southeast 29<sup>th</sup> Street is an east-west arterial that – together with I-40 – forms the northern boundary of the base. Douglas Boulevard is a four-lane, north-south arterial that forms the eastern boundary of the base and provides access to the base through the Lancer Gate. I-40 runs along the northern boundary of the base and provides access to the base via Air Depot Boulevard/Tinker Gate and Eaker Gate. Interstate-240, an east-west principal arterial located south of the base, provides access to the base by Sooner Road, Air Depot Boulevard (Gott Gate) and Douglas Boulevard.

##### **3.4.2.2 Tinker AFB and at the Proposed Project Location**

#### **Circulation**

A network of arterial, collector, and local roads serves Tinker AFB. A system of local roads supports the majority of the traffic at the base. Air Depot Boulevard, East Drive, Arnold Avenue, and Patrol Road are the major arterial roads. A network of primarily two-lane collector roads provides access to facilities on the base and to the arterial network. McNarney Avenue, Reserve Road, and Mitchell Avenue are the primary collector roads.



**Tinker AFB Gate Locations  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

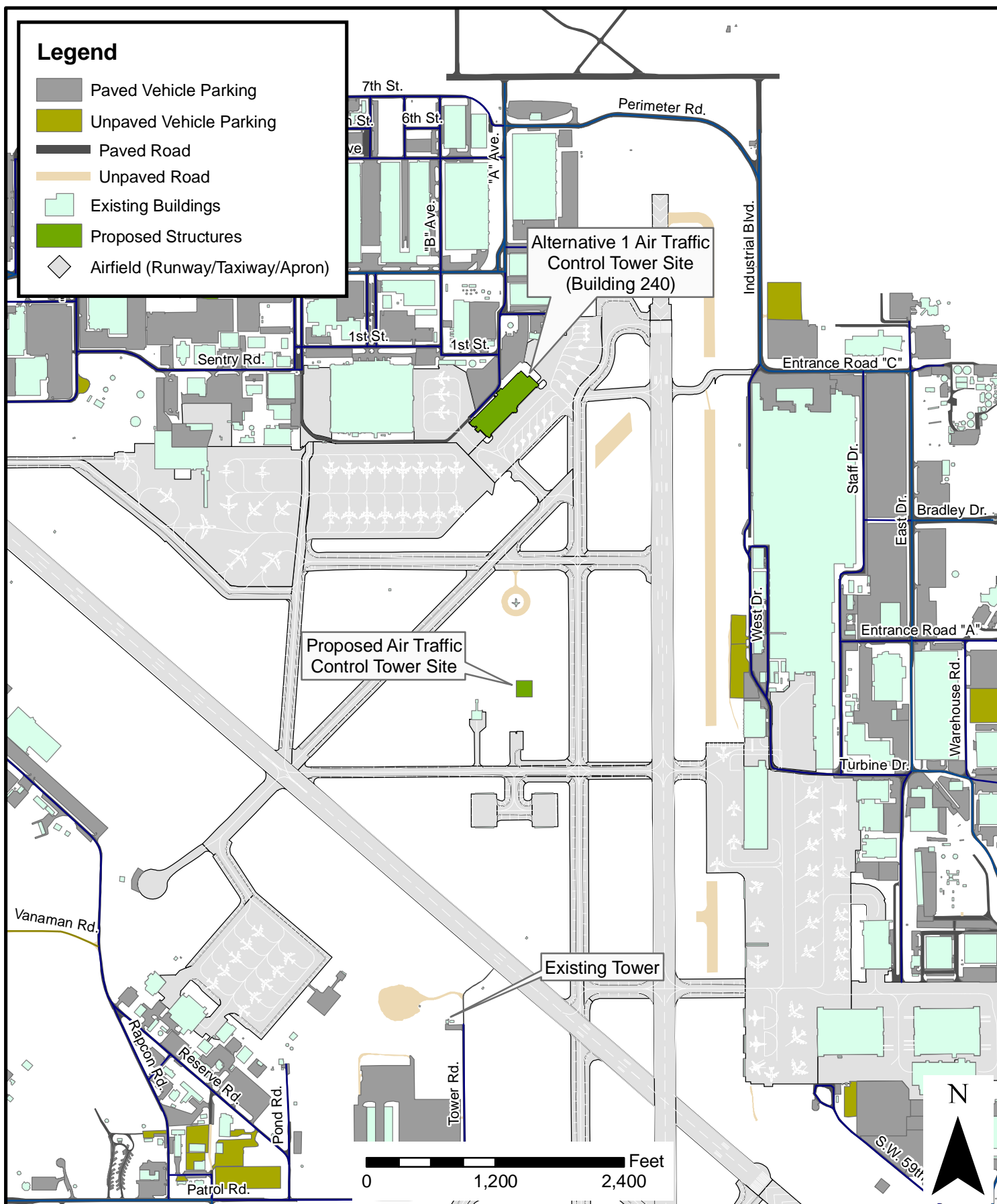
Ten gates are located on the perimeter of Tinker AFB (Tinker AFB 2005a) (Figure 3-5). Eaker Gate (Gate #2) and Lancer Gate (Gate #20) are open 24 hours per day, 7 days per week. The remaining gates are open at various times to accommodate peak flow; these gates and their associated base access routes include the following:

- Tinker Gate, via Southeast 29<sup>th</sup> Street and Air Depot Boulevard;
- Eaker Gate (Gate #2), via Southeast 29<sup>th</sup> Street and F Avenue;
- Lancer Gate, via Douglas Boulevard;
- Gott Gate (Gate #34), via Air Depot Boulevard;
- Vance Gate (Gate #40), via Sooner Road and Arnold Street;
- Hope Gate (38 EIG), via Southeast 59<sup>th</sup> Street;
- Turnbull Gate (Gate #3) at A Avenue and Southeast 29<sup>th</sup> Street;
- Hruskocy Gate (Gate #7), via Perimeter Road and Industrial Boulevard;
- Liberator Gate (Gate #21) Entrance Road A and Douglas Boulevard; and
- Marauder Gate (Gate #29) at Southeast 59<sup>th</sup> Street and Douglas Boulevard.

Access to the current ATCT site is on Tower Road, via Patrol Road. One gate (Gott Gate) accesses the southwest portion of the base and direct access to the existing ATCT. The proposed ATCT would be developed on property located in the general area of the existing Engine Hushhouse, B926, north of the existing Control Tower, in proximity to midfield. This location is approximately 1,750 feet west of the Runway 17/35 centerline and 7,500 feet east of the Runway 17 Threshold (Figure 3-6). Access to this site would be via a newly constructed road connected to an adjacent, active taxiway. The majority of traffic to the Proposed ATCT site would enter base via Tinker, Eaker, and Vance Gates.

### **Parking**

The USAF has established guidelines (Air Force Handbook (AFH) 32-1084, *Facility Requirements*) intended to ensure that adequate parking is available at USAF installations; according to these standards, the ratio of available parking spaces to personnel should be no less than 38 percent of the largest shift of civilian employees. Tinker AFB reports that 750 parking spaces are currently available for privately owned vehicles (POVs) of the 507 ARW. The total number of 507 ARW employees at Tinker AFB (including both full-time and part-time reservists) is approximately 1,100. Therefore, the ratio of available parking spaces to personnel on drill weekends when all employees are present is more than the USAF standard. Parking is a constraint when all 507 ARW personnel are on base; however, it is rare that all 1,100 personnel are on site at the same time. To alleviate this parking issue, the 507 ARW reservists are broken down into groups and the training weekends for the groups are staggered. Gate counts were not available at the time of this report to fully evaluate the current base-wide parking and traffic



constraints. The current ATCT site has 27 parking spaces to accommodate 33 employees. The proposed ATCT site will include construction of a parking area containing 24 parking spaces to accommodate 33 employees.

### 3.5 Cultural Resources

#### 3.5.1 Definition of Resource

Cultural resources represent and document activities, accomplishments, and traditions of previous civilizations and link current and former inhabitants of an area. Depending on their conditions and historic use, these resources may provide insight to living conditions in previous civilizations and may retain cultural and religious significance to modern groups.

*Archaeological resources* include areas where prehistoric or historic activity measurably altered the environment or deposits of physical remains (e.g., arrowheads, bottles) discovered therein. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic or aesthetic significance. *Architectural resources* generally must be more than 50 years old to be considered for inclusion in the NRHP, an inventory of culturally significant resources identified in the United States; however, more recent structures, such as Cold War-era resources, may warrant protection if they have the potential to gain significance in the future. *Traditional cultural resources* can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the persistence of traditional culture.

The principal federal law addressing cultural resources is the NHPA of 1966, as amended (16 USC Section 470), and its implementing regulations (36 CFR 800). The regulations, commonly referred to as the Section 106 process, describe the procedures for identifying and evaluating historic properties; assessing the effects of federal actions on historic properties; and consulting to avoid, reduce, or minimize adverse effects. As part of the Section 106 process, agencies are required to consult with the State Historic Preservation Office (SHPO).

The term *historic properties* refers to cultural resources that meet specific criteria for eligibility for listing on the NRHP; historic properties need not be formally listed on the NRHP. Section 106 does not require the preservation of historic properties but ensures that the decisions of federal agencies concerning the treatment of these places result from meaningful considerations of cultural and historic values and of the options available to protect the properties. The Proposed Action is an undertaking as defined by 36 CFR 800.3 and is subject to requirements outlined in Section 106.

The DoD's, American Indian, and Alaska Native Policy governs the department's interactions with federally recognized tribes. The policy outlines DoD trust obligations, communication procedures with tribes on a government-to-government basis, consultation protocols, and actions to recognize and respect the significance that tribes ascribe to certain natural resources and properties of traditional cultural or religious importance. The policy requires consultation with federally recognized tribes for proposed activities that could significantly affect tribal resources or interests.

### 3.5.2 Existing Conditions

#### 3.5.2.1 Regional History

Inhabited by plains tribes and sold to the United States by France as a part of the 1803 Louisiana Purchase, much of what is now Oklahoma was subsequently designated as Indian Territory. As such, it was intended to provide a new home for tribes forced by the federal government to abandon their ancestral lands in the southeastern United States. Many of those forced to relocate in the 1830s were from what were called the Five Civilized Tribes—Cherokee, Choctaw, Chickasaw, Creek, and Seminole—who soon set up independent nations in the new territory. After the Civil War, the pressure of westward expansion brought railroads into the Indian Territory, where the U.S. government began to declare some land available for settlement. Prairie land surrounding a Santa Fe railroad boxcar station was designated as a townsite when presidential proclamation opened the central portion of the Indian Territory to claims stakers in 1889.

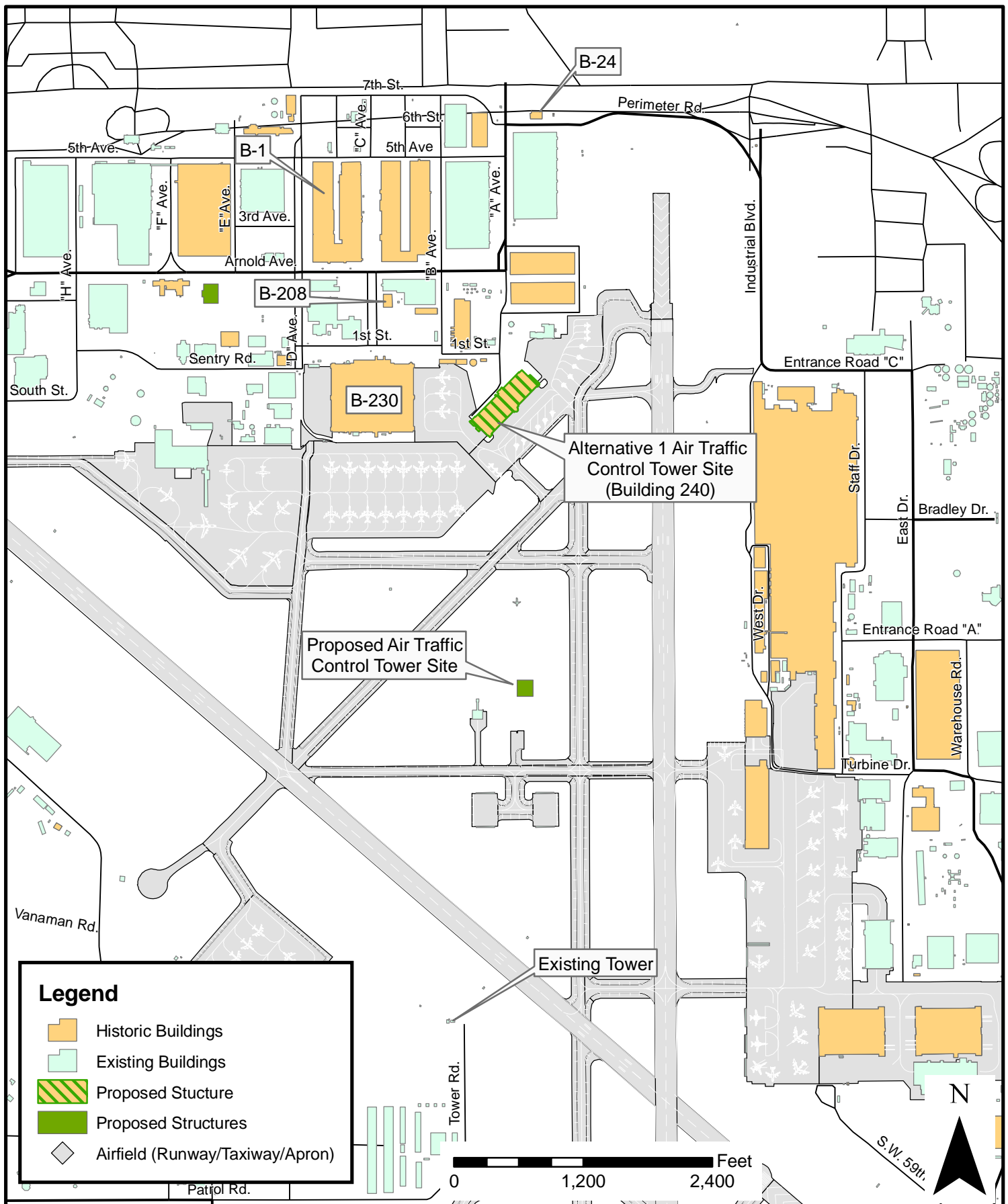
That settlement (now Oklahoma City) attained official status in 1890, just a few weeks after the western half of the Indian Territory was redesignated Oklahoma Territory. Railroad connections to the city helped make it a center for trade, milling and meat packing (Oklahoma City Convention and Visitors Bureau [OCCVB] 2006).

#### 3.5.2.2 Tinker AFB and the Proposed Project Site

Tinker AFB has implemented an Integrated Cultural Resources Management Plan (ICRMP), which is designed to assist the installation in continuing to maintain and operate existing facilities, and in developing new facilities, as needed, in compliance with federal and state legislation protecting cultural resources (Tinker AFB 2005c). Cultural resources are protected under the NHPA of 1966, as amended. Both significant archaeological and historic architectural resources that have not been evaluated must be considered eligible for the NRHP until appropriately evaluated and SHPO concurrence has been documented (Tinker AFB 2005c).

Two historic property types have been identified at Tinker AFB: facilities associated with aircraft construction and modification, 1942-1946; and facilities associated with the Cuban Missile Crisis, 1962. The Douglas Cargo Aircraft manufacturing area has been designated as a historic district with seven contributing buildings (Tinker AFB 2002a). Tinker also has five individually eligible buildings (B1, B208, B230, B240, and B4029) (Tinker AFB 2005a) (Figure 3-7).

Approximately 131 known archaeological sites are present in areas adjacent to the base (Tinker AFB 2002a). In the fall of 2000, an archeological survey was completed on a 500-acre area at the northwest corner of the base. It was determined that the area along Crutch Creek is most likely to contain buried archeological sites along the flood deposits of the creek (Tinker AFB 2002a).



EA

**Historic Property Locations  
Construction of Air Traffic Control Tower  
Tinker Air Force Base**

**FIGURE  
3-7**



Tinker AFB has initiated consultations with three Native American tribes: Seminole Nation, Osage Nation, and Muskogee Nation. These tribes have verbally commented that they have no Native American Graves Protection and Repatriation Act (NAGPRA) or American Indian Religious Freedom Act (AIRFA) concerns about Tinker AFB property. Additionally, they have communicated that Tinker AFB property is not suitable for religious or burial sites (Tinker AFB 2005c). The proposed project site and Alternative 1 ATCT site, both located within the Tinker AFB Airfield, contain no known or suspected Traditional Cultural Properties (TCP).

### 3.6 Hazardous Materials and Wastes

#### 3.6.1 Definition of Resource

Hazardous materials are defined as substances with strong physical properties of ignitability, corrosivity, reactivity, or toxicity which may cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous wastes are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes which pose a substantial present or potential hazard to human health or the environment.

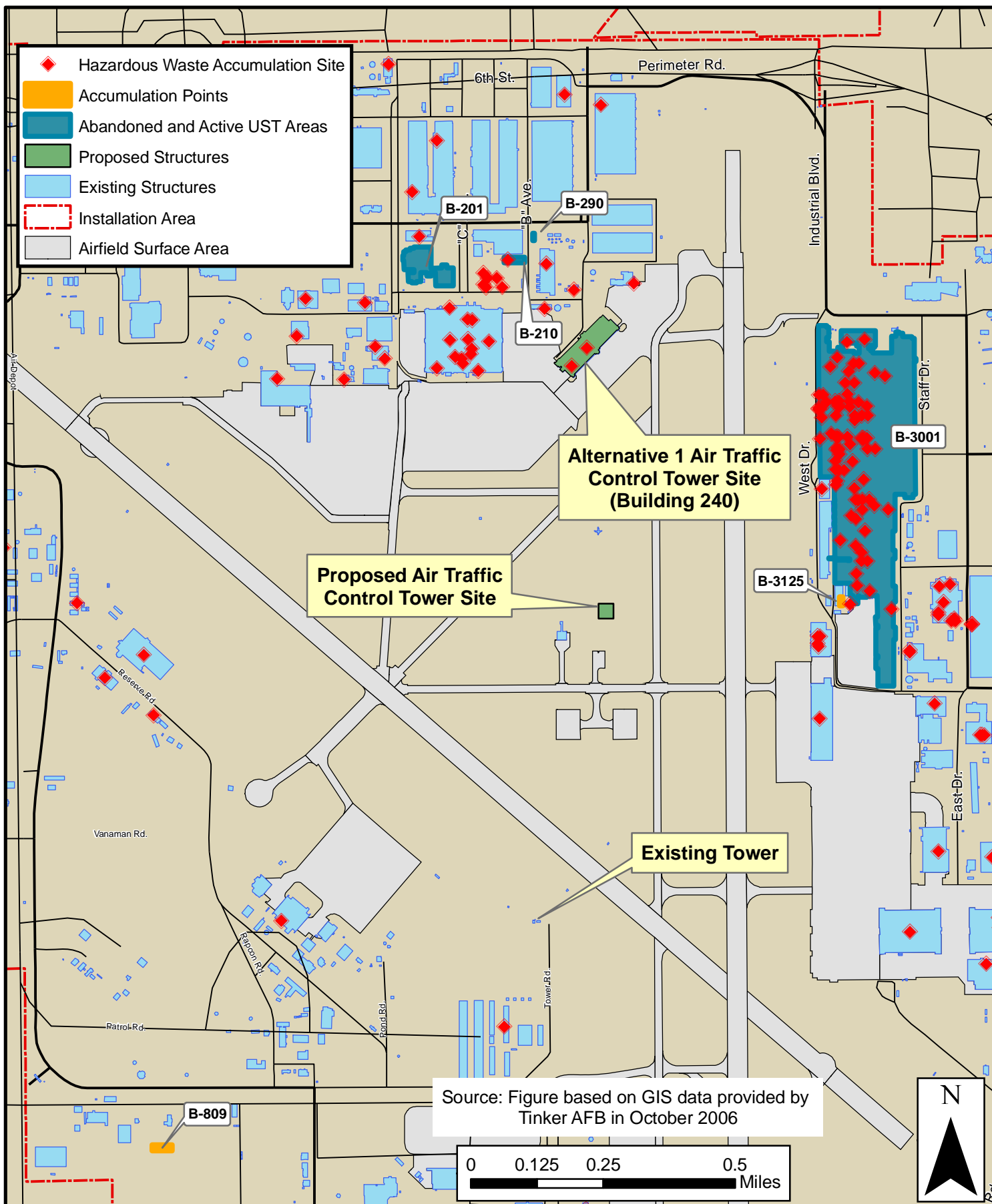
Issues associated with hazardous materials and wastes typically center around underground storage tanks (USTs); aboveground storage tanks (ASTs); and the storage, transport, and use of pesticides, bulk fuel, and petroleum, oils, and lubricants (POLs). When such resources are improperly used they can threaten the health and well-being of wildlife species, botanical habitats, soil systems, water resources, and people.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, DoD has dictated that all facilities develop and implement *Hazardous Waste Management Plans* or *Spill Prevention and Response Plans*. Also, DoD has developed the Environmental Restoration Program (ERP), intended to facilitate thorough investigation and cleanup of contaminated sites located at military installations. These plans and programs, in addition to established legislation (e.g., CERCLA and Resource Conservation and Recovery Act [RCRA]) effectively form the “safety net” intended to protect the ecosystems on which most living organisms depend.

#### 3.6.2 Existing Conditions

##### 3.6.2.1 Hazardous Materials

A large amount of hazardous materials are utilized to perform the mission of Tinker AFB. The Hazardous Materials Management Program (HMMP) manages the procurement and use of hazardous materials at the base (Figure 3-8). The HMMP functions through the Hazardous Materials Pharmacy, which consists of a decentralized Hazardous Material Pharmacy Cell and a Hazardous Materials electronic tracking system, the Hazardous Material Management System (HMMS).



1241 The HMMS database management system performs the following automated functions:

- 1242 • Tracks training, exposure, inventory, and personal protective equipment;
- 1243 • Dispenses hazardous materials according to units of use;
- 1244 • Serves as central issue point for Just-In-Time control and issue;
- 1245 • Creates on-line Material Safety Data Sheets (MSDS); and
- 1246 • Maintains hazardous materials control by authorized user, zone, and task.

1247 The tracking system provides the data necessary to meet reporting requirements, assess processes  
1248 for pollution prevention opportunities, and measure success in minimizing hazardous materials  
1249 usage (Tinker AFB 2006a).

1250 Tinker AFB's OC-ALC Plan 19-2 Spill Prevention and Emergency Response Plan for Hazardous  
1251 and Extremely Hazardous Material and Spill Prevention Control and Countermeasures Plan  
1252 (Tinker AFB 2004) presents specific procedures for preparing for and responding to inadvertent  
1253 discharges of oil or releases of hazardous substances at the base. In 2002, Tinker AFB  
1254 developed the Storm Water Pollution Prevention Program (SWPPP) to comply with the  
1255 conditions of the DEQ Multi-Sector General Permit (MSGP) for Storm Water Discharges  
1256 Associated with Industrial Activities and DEQ Phase II Small Municipal Separate Storm Sewer  
1257 System (MS4). The SWPPP provides base-wide and facility-specific Best Management  
1258 Practices (BMPs) to reduce pollutants in stormwater discharges from the base. The BMPs for  
1259 Tinker AFB include:

- 1260 • Source controls;
- 1261 • Management practices;
- 1262 • Preventive maintenance;
- 1263 • Spill prevention and response;
- 1264 • Erosion and sediment controls; and
- 1265 • Identification of stormwater pollution prevention personnel.

### 1266 **3.6.2.2 Fuel Storage**

1267 The fuels and materials stored and handled in bulk at the base include JP-5, JP-8 (aviation fuel),  
1268 JP-10 (missile fuel), Mogas (automotive gasoline), PF-1, diesel fuel, biodiesel fuel, calibration  
1269 fluid and de-icing fluid. Conoco supplies JP-8 fuel to Tinker AFB through a 6-inch supply line  
1270 that enters the northern section of the base and continues to the main tank farm (Tinker AFB  
1271 2005a). Tanker trucks are used as a backup to deliver JP-8, which is dispensed to aircraft either  
1272 from eleven R-11 refuelers or directly through hydrants on the aprons on the west, south, and  
1273 east sides of the base. An estimated 54 percent of aircraft refueling is done through hydrants and

1274 the remaining 46 percent is by trucks. Approximately 50 percent of defueling is done by  
1275 hydrants and approximately 50 percent is by trucks (Tinker AFB 2006a).

1276 Various fuels at the base are also stored in ASTs and USTs. Releases from ASTs and USTs  
1277 (i.e., spills, overfill and leaks) can cause fires or explosions that threaten human safety and can  
1278 contaminate soil and groundwater that threaten human health. The main goal of the base's  
1279 storage tank program is to protect groundwater and soil from contamination by ensuring that:

- 1280 • all ASTs meet all applicable requirements including requirements for leak testing and  
1281 preventing, responding to, reporting, and cleaning up spills;
- 1282 • new USTs (including piping) are designed and constructed to provide the following:  
1283 corrosion protection, release detection, spill and overfill prevention, proper installation,  
1284 and secondary containment; and
- 1285 • all existing USTs (any regulated UST installed before 22 December 1988) are upgraded  
1286 to meet the standards for new USTs (Tinker AFB 2005a).

1287 An aggressive investigation of abandoned and active USTs at Tinker AFB began in September  
1288 1985. Eighty-eight active tanks and 38 abandoned tanks were identified and located. Most of  
1289 those tanks were found in the vicinity of Building 3001 and in the north central portion of the  
1290 base near B201, B210 and the B290 Fuel Farm.

1291 As of 31 July 1999, 26 sites were established with the Oklahoma Corporation Commission  
1292 (OCC) to investigate releases from USTs. Tinker AFB has completed the majority of the  
1293 investigations for determining the nature and extent of contamination at each UST site; several of  
1294 those sites are in active remediation. Currently, fifteen of the activated sites have been closed or  
1295 deactivated in accordance with OCC regulations that were in effect prior to 1 September 1996.  
1296 These previous rules used a system that categorized UST sites for remediation based on generic  
1297 contaminant levels in soils and groundwater. On 1 July 1996, the OCC issued new rules that  
1298 classify sites for remediation based on risk to human health and the environment. The process is  
1299 referred to as the Oklahoma Risk-Based Corrective Action (ORBCA) Program. Eleven sites are  
1300 still open and are in remediation or have been recommended for case closure. In addition, two  
1301 UST removals were performed in 1998, and tank closure reports were submitted to the OCC in  
1302 December 1998 for each site. According to the ECAMP FY 2006 Final Report, Tinker AFB  
1303 currently maintains 36 active USTs and 90 active ASTs (Tinker AFB 2006a).

1304 No USTs or ASTs are known to have been installed at the proposed project site or at the  
1305 Alternative 1 site.

### 1306 **3.6.2.3 Environmental Restoration Program**

1307 The Defense Environmental Restoration Program (DERP) was established by Section 211 of the  
1308 Superfund Amendments and Reauthorization Act of 1986 (SARA). It is a single program,  
1309 funded by several accounts, that provides for the cleanup of hazardous substances associated

with past DoD activities and is consistent with the provisions of CERCLA, as amended. Three program categories have been established under DERP: Installation Restoration Program (IRP), Other Hazardous Waste (OHW), and Building Demolition/Debris Removal (BD/DR). The USAF subsequently established its ERP, in 1996, to locate and investigate hazardous waste sites, known as IRP sites, on its installations. Tinker AFB began its IRP in 1980, with a total of 40 IRP sites including landfills, fire training pits, radioactive waste disposal sites, fuel storage areas, industrial waste pits, and the IWTP identified at Tinker AFB since the beginning of the IRP (Tinker AFB 2005a). A total of 23 of the IRP sites are addressed under RCRA guidance and four are addressed under CERCLA as operable units on the NPL. Seventeen of the 40 sites have been closed, and no further action is required.

No IRP sites are located in the vicinity of the proposed project site or Alternative 1 site.

### **3.7 Visual Resources**

#### **3.7.1 Definition of Resource**

Visual resources are defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and manufactured features are considered characteristic of an area if they are inherent to the structure and function of a landscape.

#### **3.7.2 Existing Conditions**

##### **3.7.2.1 Regional Visual Character**

Tinker AFB is located in the Central Red Bed Plains section of Oklahoma. Topography of this section of Oklahoma is characterized by gently rolling to nearly level uplands. Tinker AFB is situated on a broad area of uplands that forms a watershed divide. The visual characters of the Oklahoma City area are consistent with other cities in the Central United States, ranging from tall buildings in the Oklahoma City downtown area to large agricultural and residential properties in more rural areas. Properties adjacent to Tinker AFB vary widely and include, but are not limited to, commercial, industrial, residential, and vacant properties.

##### **3.7.2.2 Visual Resources at Tinker AFB and the Proposed Project Location**

Tinker AFB has a visual character typical of a military aviation complex with a mixture of large industrial facilities and hangars, as well as smaller structures for administrative and support functions. A network of roadways and sidewalks provide routes for vehicle and pedestrian traffic. Various outdoor recreation areas including the Urban Greenway consisting of a 110-acre wildlife and nature corridor, a golf course, athletic fields, bicycle paths, and other facilities are available for the base's population. Tinker AFB utilizes the USAF Architectural Compatibility Guide developed in 2003 to guide the planning and design of facilities at the base to ensure building materials, design, signage, and landscape components are incorporated into new

facilities and site improvements to present a cohesive and visually pleasing image (Tinker AFB 2005a).

Facilities within the seven architectural districts vary in character as a result of land use and function. The landscape of Tinker AFB is primarily composed of ornamental trees, shrubs, and turf grass and varies from areas with large mature trees and shrubs to areas with little or no landscaping depending on the function of the area. Areas of the natural landscape, including such resources as wetlands, greenways, and riparian corridors, have been preserved for their ecological significance as well as to enhance the attractiveness of the base.

The proposed project site is a vacant, field situated in the airfield environment surrounded by taxiways and runways. Alternative 1 ATCT site is also located in the airfield environment. Visual resources at both sites can be considered characteristic of an active military airfield.

### **3.8 Safety**

#### **3.8.1 Definition of Resource**

The primary safety concern with regard to military aircraft activity is the potential for aircraft mishaps (i.e., crashes), which may be caused by mid-air collisions with other aircraft or objects, weather difficulties, or bird-aircraft strikes, or on-ground collisions between aircraft. A properly sited ATCT, at Tinker AFB, is required to provide air traffic controllers a clear view of the runways, taxiways, traffic patterns, alert areas, restricted areas, and parking aprons to ensure adequate and safe airborne and ground traffic control on and around the airfield. The tower must have adequate space for air traffic control operations, controller administrative functions, personnel training, crew briefings, electronic equipment maintenance, radio and telephone support equipment, and environmental controls.

#### **3.8.2 Existing Conditions**

##### **3.8.2.1 ATCT at Tinker AFB**

The existing ATCT facility, B935, was designed and built in 1970 to accommodate only ATC operations and included space to accommodate limited ATCT equipment of that era. Since the tower's establishment, the structural, mechanical, and electrical components of the ATCT facility have deteriorated to the point that repairs are often required. The control tower, as currently sited, violates the current Air Force siting criteria since it is located less than 1,000 feet from the runway centerline. The building has been deemed substandard and is not adequately configured to allow renovation to incorporate all current ATCT operations functions. The ATCT cab is also not current with the National Fire Protection Association's (NFPA) Life and Safety Code, NFPA 101, and seismic requirements for USAF ATCTs.

The tower cab, by today's standards, is too small and cramped to accommodate all the occupants and trainees. The 2004 Air Traffic System Evaluation by AFMC/HQ identified the control tower cab as too small for current operations: "The size and noise level in the tower cab is far from ideal in accommodating the five control positions. During the evaluation period, as many as

12 people were in the tower cab performing official duties and if measures are not taken to limit the number of people or modify/replace the tower cab, the noise level and attendant distractions may lead to an erosion of the quality of ATC service.”

Three additional safety concerns are associated with the existing control tower:

- Fire suppression system- the current tower lacks adequate fire suppression and evacuation systems;
- Personal safety- the highest set of stairs leading to the tower cab is steep and not very deep. Several controllers have fallen or lost their footing and slid down the steps. One controller was disabled from work for several months with a head injury stemming from a stairway fall. The new USAF standard tower does not contain these types of stairs; and
- Structural inadequacy- when wind speeds exceed 60 knots (69 mph), evacuation of the control tower is required. Current USAF standard towers are designed to withstand wind speeds of 88 knots (101 mph).

The building has been deemed substandard and is not adequately configured to allow renovation to incorporate all current ATCT operations functions.

### **3.8.2.2 Runway Protection Zones**

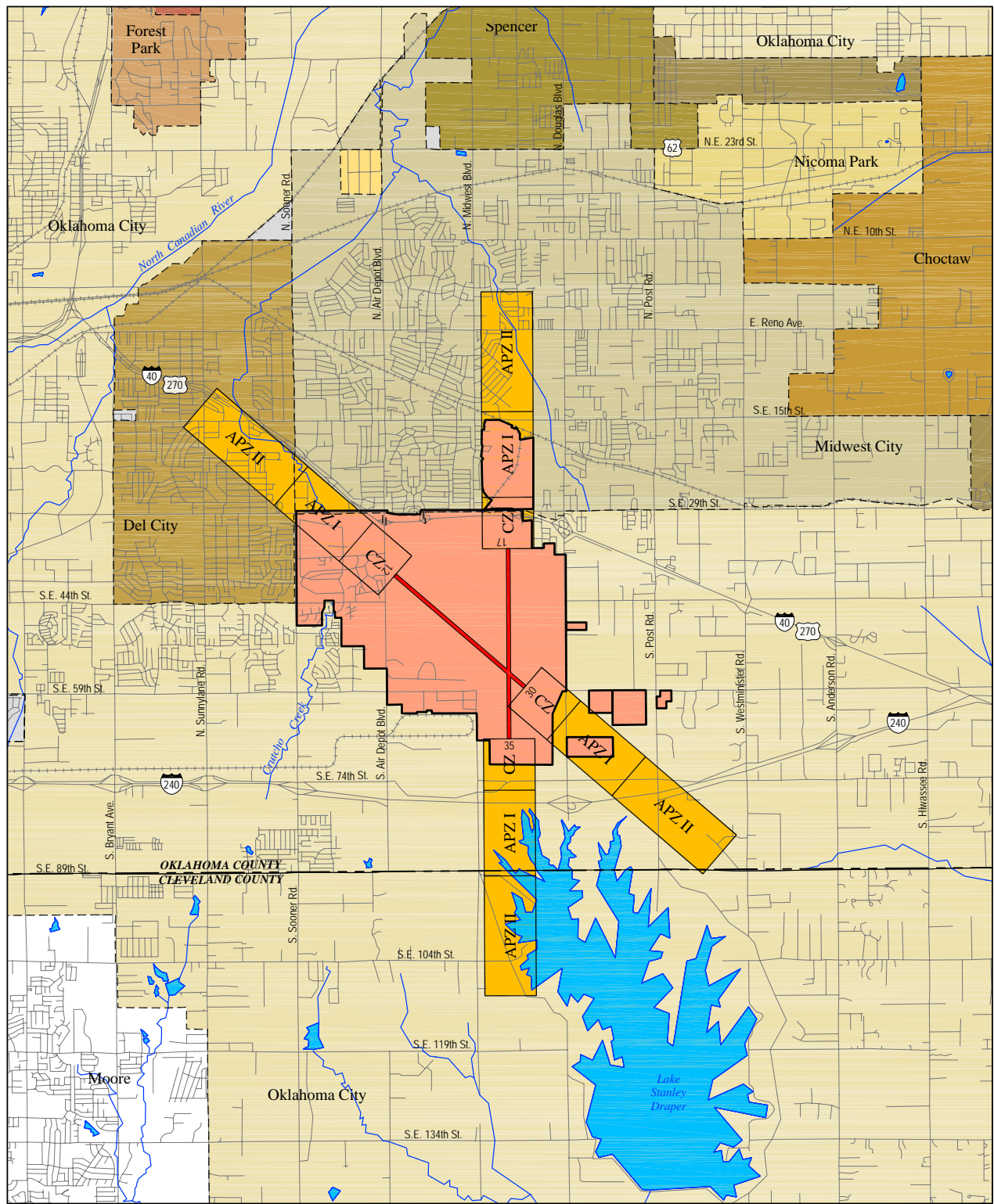
Accident Potential Zones (APZs) and Clear Zones (CZs) are rectangular zones extending outward from the ends of active military airfields that delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during takeoff or landing. The CZs and APZs for Runways 17/35 and 12/30 at Tinker AFB are depicted in Figure 3-9. Each end of Runway 17/35 at Tinker AFB has a 3,000 foot by 3,000 foot CZ and two APZs, while each end of Runway 12/30 has a 3,000 foot by 3,000 foot CZ and single 3,000 foot wide by 5,000 foot-long APZ (Tinker AFB 2006b). Neither the proposed project site nor ATCT Alternative 1 site are located in either APZs or CZs (Figure 3-9).

#### ***Clear Zones***

The CZ has the highest accident potential of the three zones, as 27 percent of accidents studied occurred in this area. As stated previously, it is USAF policy to request that Congress authorize and appropriate funds to purchase the real property interests in this area to prevent incompatible land uses. Currently at Tinker AFB, all land use with CZs would be considered compatible (Tinker AFB 2006b).

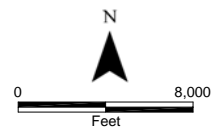
#### ***Accident Potential Zones I and II***

APZ I is an area that possesses somewhat less accident potential than the CZ, with 10 percent of the accidents studied occurring in this zone. APZ II has less accident potential than APZ I, with 6 percent of the accidents studied occurring in this zone. While the potential for aircraft accidents in APZs I and II does not warrant land acquisition by the USAF, land-use planning and controls are strongly encouraged in these areas for the protection of the public (Tinker AFB 2006b).



#### LEGEND

- |  |             |  |     |                         |
|--|-------------|--|-----|-------------------------|
|  | Runway      |  | CZ  | Clear Zone              |
|  | Roadway     |  | APZ | Accident Potential Zone |
|  | City Limits |  |     |                         |
|  | Tinker AFB  |  |     |                         |



Source: Tinker AFB 2006a

EA

## Clear Zones and Accident Potential Zones Construction of Air Traffic Control Tower Tinker Air Force Base

FIGURE  
3-9



APZ I is 3,000 ft wide by 5,000 ft and has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. APZ II, also 3,000 ft wide, is 7,000 ft long extending to 15,000 ft from the runway threshold. Acceptable uses include those of APZ I, as well as low density single family residential and those personal and business services and commercial/retail trade uses of low intensity or scale of operation. High density functions such as multi-story buildings, places of assembly (e.g., theaters, churches, schools, restaurants, etc.), and high density office uses are not considered appropriate (Tinker AFB 2006b).

Incompatible land use is currently established within APZs associated with the airfield at Tinker AFB and is summarized in Table 3-3. APZs I and II located off Runways 17 and 12 contain commercial and sensitive receptors (i.e., residences, schools, libraries, etc.), respectively.

**Table 3-3 Acres of Incompatible Land Use within Clear Zones, Accident Potential Zones I and II Associated with Runways 12/30 and 17/35**

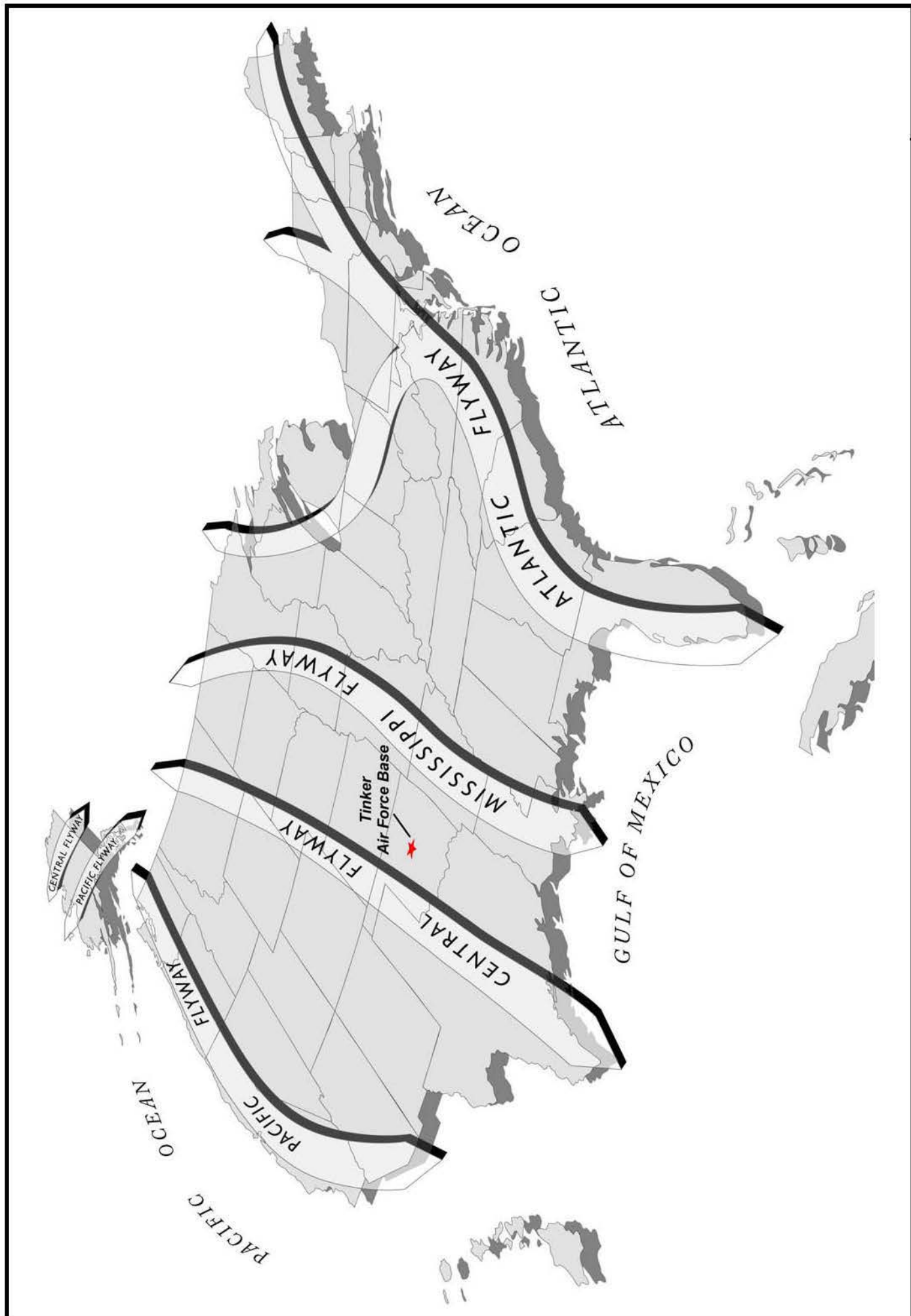
Land Use	Acres of Incompatible Land Use		
	CZ	APZ I	APZ II
Residential	0	4	408
Commercial	0	41	0
Industrial	0	0	0
Public/Quasi-public	0	4	121
Recreational/Open Space/Agricultural/Low Density	0	0	0
<b>Total</b>	<b>0</b>	<b>49</b>	<b>529</b>

Source: Tinker AFB 2006b.

### 3.8.2.3 Bird-Aircraft Strike Hazard

BASH is defined as the threat of aircraft collision with birds or other wildlife during flight operations and is a safety concern at all airfields due to the frequency of aircraft operations and the possibility of encountering birds at virtually all altitudes. Most birds fly close to ground level; correspondingly, more than 95 percent of all reported bird-strikes occur below 3,000 ft AGL. At most military installations, about half of reported bird strikes occur in the immediate vicinity of the airfield and another 25 percent occur during low-altitude local training exercises.

Bird-aircraft strikes present a potential threat to Tinker AFB aircraft and aircrew safety due to resident bird species as well as the installation's proximity to Lake Stanley Draper and the bird migratory route known as the Central Flyway (Figure 3-10).



EA	Migratory Flyways Over the United States	FIGURE 3-10
----	--	----------------

According to BASH data, 27 reported bird-strikes have occurred since 2000 at or in the immediate vicinity of Tinker AFB (Table 3-4) (Tinker AFB 2006c). The USAF BASH Team has developed bird avoidance models to predict and minimize the probability of hitting waterfowl and raptors within the base area; the team's studies show the relative bird-strike possibility according to the time of year, time of day, and phase of flight. Late fall and winter months show higher rates for bird-strike probability. Waterfowl strike potential is highest in the night, while raptor strike potential is highest during midday. Bird-strike potential is also higher during landing and low level phases of flight.

**Table 3-4 Bird-Strike Occurrence for Tinker AFB (2000-2005)**

	2000	2001	2002	2003	2004	2005
Total	5	7	5	4	2	4

Source: Tinker AFB 2006c.

In order to minimize the potential for bird-strikes, Tinker AFB has contracted the U.S. Department of Agriculture (USDA)-Wildlife Services to conduct all live bird control on the base, which includes two full-time professional bird-control staff to provide round-the-clock coverage. A *BASH Plan* (2006) has also been implemented, key elements of which include (Tinker AFB 2006c):

- establishment of a Bird Hazard Working Group which designates responsibilities and establishes of procedures that aid supervisors in preventative actions intended to reduce bird-strike hazards;
- provision of appropriate channels for timely dissemination of bird hazard information and procedures for avoidance of such hazards (e.g., migratory flocks); and incorporation of standardized guidelines for reporting bird sightings and strikes.

### **3.9 Noise and Vibration**

#### **3.9.1 Definition of Resource**

##### **3.9.1.1 Noise**

Noise is defined as unwanted sound or, more specifically, as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (Federal Interagency Committee on Noise [FICON] 1992). Human response to noise can vary according to the type and characteristics of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day.

Due to the wide range in sound levels, sound is expressed in decibels (dB), a unit of measure based on a logarithmic scale. A 10-dB increase in noise level corresponds to a 100-percent increase (or doubling) in perceived loudness. As a general rule, a 3-dB change is necessary for noise increases to be noticeable to humans (Bies and Hansen 1988). Sound measurement is further refined by using an A-weighted decibel scale that emphasizes the range of sound

1480 frequencies that are most audible to the human ear (i.e., between 1,000 and 8,000 cycles per  
1481 second). Unless otherwise noted, all decibel measurements presented in this EA are A-weighted  
1482 (dBA).

1483 Day-night average sound level ( $L_{dn}$ ) is a noise metric that averages A-weighted sound levels over  
1484 a 24-hour period, with an additional 10-dB penalty added to noise events occurring between  
1485 10:00 p.m. and 7:00 a.m. This penalty is intended to compensate for generally lower background  
1486 noise levels at night and the additional annoyance of nighttime noise events.  $L_{dn}$  is the preferred  
1487 noise metric of the US Department of Housing and Urban Development (HUD), the US  
1488 Department of Transportation (USDOT), Federal Aviation Administration (FAA), USEPA,  
1489 Veterans' Administration, and US Department of Defense (DoD).

1490 Two of the primary factors that reduce levels of environmental sounds are increasing the distance  
1491 between the sound source and the receiver and having intervening obstacles such as walls,  
1492 buildings or terrain features that block the direct path between the sound source and the receiver.  
1493 Factors that act to increase the loudness of environmental sounds include moving the sound  
1494 source closer to the receiver, sound enhancements caused by reflections, and focusing caused by  
1495 various meteorological conditions.

1496 Table 3-5 identifies noise levels associated with some common indoor and outdoor activities and  
1497 settings and indicates the subjective human judgments of noise levels, specifically the perception  
1498 of noise levels doubling or being halved. For reference purposes, a baseline noise level of 70 dB  
1499 is described as moderately loud. As can be seen in the table illustrating the logarithmic dB scale,  
1500 humans perceive an increase of 10 dB as a doubling of loudness, while an increase of 30 dB  
1501 corresponds with an eight-fold increase in perceived loudness.

1502 **Table 3-5 Sound Levels of Typical Noise Sources and Noise Environments**

Noise Source (at a given distance)	A-Weighted Sound Level Scale (dBA)	Noise Environment	Human Judgment of Noise Loudness <sup>1</sup>
Military Jet Takeoff with Afterburner (50 ft)	140		
Civil Defense Siren (100 ft)	130	Carrier Flight Deck	
Commercial Jet Takeoff (200 ft)	120		<u>Threshold of Pain</u>
Pile Driver (50 ft)	110	Rock Music Concert	32 times as loud 16 times as loud
Ambulance Siren (100 ft)	100		<u>Very Loud</u>
Newspaper Press (5 ft)			8 times as loud
Power Lawn Mower (3 ft)			
Motorcycle (25 ft)	90	Boiler Room	4 times as loud
Prop. Plane Flyover (1,000 ft)		Printing Press Plant	
Diesel Truck, 40 mph (50 ft)			

1503 **Table 3-5 Sound Levels of Typical Noise Sources and Noise Environments (Continued.)**

Noise Source (at a given distance)	A-Weighted Sound Level Scale (dBA)	Noise Environment	Human Judgment of Noise Loudness <sup>1</sup>
Garbage Disposal (3 ft)	80	High Urban Ambient Sound	2 times as loud
Passenger Car, 65 mph (25 ft)			<u>Moderately Loud</u>
Living Room Stereo (15 ft)	70		
Vacuum Cleaner (3 ft)			
Normal Conversation (5 ft)	60	Data Processing Center	1/2 as loud
Air Conditioning Unit (100 ft)		Department Store	
Light Traffic (100 ft)	50	Private Business Office	1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban	<u>Quiet</u>
		Ambient Sound	1/8 as loud
Soft Whisper (5 ft)	30	Quiet Bedroom	
	20	Recording Studio	Just Audible
	10		Threshold of Hearing

<sup>1</sup>Relative to a reference loudness of 70 dBA.

ft = feet

Source: FICON 1992.

### 1507 3.9.1.2 Noise in the Airfield Environment

1508 **Aircraft Operations.** Analyses of aircraft noise exposure and compatible land use around DoD  
1509 facilities are normally accomplished using a group of computer-based programs, collectively  
1510 called NOISEMAP (USAF 1992). NOISEMAP, through its program BASEOPS, allows entry of  
1511 runway coordinates, airfield information, flight tracks, flight profiles (e.g., engine thrust settings,  
1512 altitudes, and speeds) along each flight track for each aircraft, numbers of flight operations, run-  
1513 up coordinates, run up profiles, and run up operations. The model's output comprises a regularly  
1514 spaced "grid" file containing L<sub>dn</sub> values. The NMPlot program uses the grid file to plot  
1515 contours of equal L<sub>dn</sub>, which can then be overlaid onto maps to depict current noise exposure  
1516 levels in the Tinker AFB airfield environment. In airport noise analyses, noise contours are used  
1517 to help determine compatibility of aircraft operations and local land use.

1518 Noise levels from flight operations exceeding ambient background noise typically occur beneath  
1519 main approach and departure corridors, near local air traffic patterns around the airfield, and in  
1520 areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft take off and  
1521 gain altitude, their noise contribution drops.

1522 **Engine Test and Maintenance Runs.** Although noise resulting from aircraft flight operations  
1523 represents the greatest contribution to the overall noise environment near the airfield, engine run-  
1524 ups may also influence total ambient noise levels. Pre-flight engine run-ups and aircraft  
1525 maintenance activities are typically confined to the aircraft parking ramps and engine test areas.

### 3.9.1.3 Vibrations

*Vibration* is an oscillatory motion which can be described in terms of the displacement, velocity, or acceleration. Because the motion is oscillatory, there is no net movement of the vibration element and the average of any of the motion descriptors is zero. *Displacement* is the easiest descriptor to understand. For a vibrating floor, the displacement is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement and acceleration is the rate of change of the speed. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity or acceleration.

Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. *Vibration displacement* is the distance that a point on a surface moves away from its original static position. The instantaneous speed a point on a surface moves is described as the velocity, and the rate of change of the speed is described as the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause ground-borne vibration. Analysis of this type of vibration is best measured in velocity and acceleration (FTA 2006).

The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal and RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response (FTA 2006).

## 3.9.2 Existing Conditions

### 3.9.2.1 Regional Setting

The noise environment of communities surrounding Tinker AFB is characteristic of a moderately dense developed urban area, with some areas of undeveloped land south of the base. The urban developed setting typically experiences noise associated with vehicles on highways, railways, aircraft, or industrial activities. Undeveloped areas typically experience noise associated with local highways, aircraft, or light industrial activities. According to FICON, the following communities have the indicated typical ranges of outdoor  $L_{dn}$  noise levels: *Rural*, 40 to 48  $L_{dn}$ ; *Small Town and Quiet Suburban*, 45 to 55  $L_{dn}$ ; *Urban Residential*, 58 to 62  $L_{dn}$ ; *Suburban and Low Density Urban*, 52 to 60  $L_{dn}$ ; and *Noisy Urban Residential* 63 to 67  $L_{dn}$  (FICON 1992). Civilian areas adjacent to the airfield support residential, commercial, public/quasi-public and open/agricultural/low density. Much of the area surrounding the base to the north, east, and west contains moderately dense residential, while areas to the south are sparsely populated with noise levels of correspondingly low magnitude. Tinker AFB aircraft activity is the dominant noise

producer in the region with residences and an elementary school present within the 65+  $L_{dn}$  contour.

### 3.9.2.2 Tinker AFB and Proposed Project Location

According to the 2006 Air Installation Compatible Use Zone (AICUZ) Study, 65 to 75  $L_{dn}$  noise contours associated with aircraft operations extend beyond the boundary of Tinker AFB to the north and 65 to 80  $L_{dn}$  noise contours extend off base to the south. Noise contours are concentrated around Runway 17/35, the primary runway at the base. Runway 17/35 is aligned in a north-south direction, which allows aircraft to takeoff and land over relatively unpopulated areas to the south such that higher noise levels occur over areas which do not support sensitive noise receptors or noise-sensitive land uses. Off the ends of Runway 17/35, the 65  $L_{dn}$  noise contour extends approximately three and four miles beyond the base boundary to the north and south, respectively. The entire 85+  $L_{dn}$  noise contour is within the base boundary. Acreage impacted by aircraft operations at Tinker AFB is summarized in Table 3-6 (Tinker AFB 2006b).

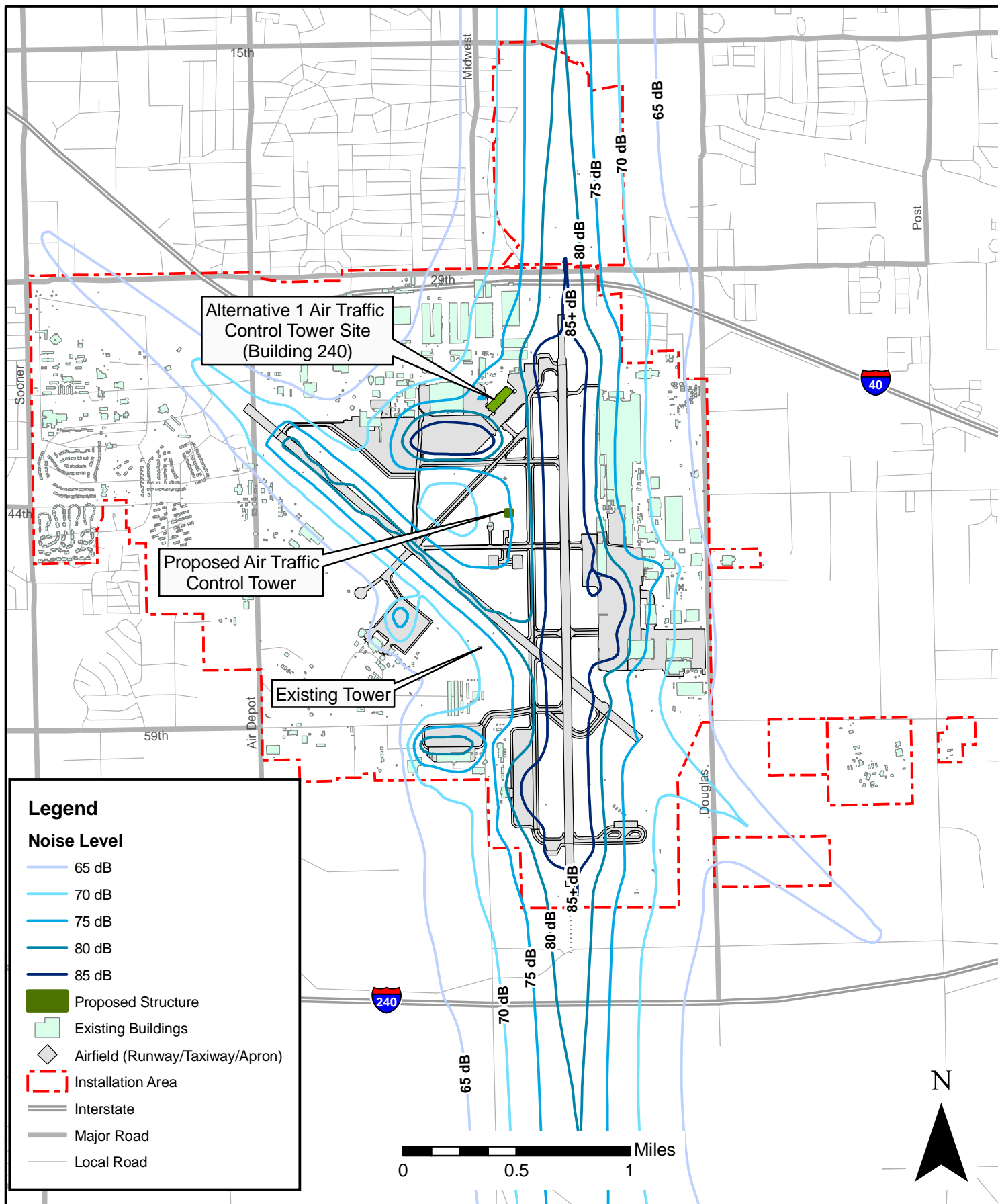
**Table 3-6 Noise Exposure Acreage from Aircraft Operations at Tinker AFB**

Noise Level	Acreage Beyond Base Boundary	Total Acreage
65-69	3,710	4,391
70-74	1,239	1,978
75-79	549	1,203
80+	75	844
<b>Total &gt; 65</b>	<b>5,573</b>	<b>8,416</b>

Source: Tinker AFB 2006b.

The Proposed Action site lies between the 75-80 $L_{dn}$  contour lines (Figure 3-11). The Alternative 1 sites fall between the 75-80 $L_{dn}$  (Building 240) (Figure 3-11).

Current vibration levels at Tinker AFB are the result of aircraft operations both, during aircraft departures and aircraft engine maintenance and test runs. Vibration levels are short-term during aircraft departures and occur during engine maintenance and test runs at higher power settings (military power and afterburner), which varies depending on engine type. The majority of maintenance and test engine runs occurring at the higher power settings take place in areas with noise suppression with the exception of those that take place on the two trim pads located in between the two active runways. The T-10 hush house is approximately 400 feet (ft) from the proposed ATCT. Although vibration levels associated with engine tests at afterburner within the hush house would likely be slightly perceptible, it is unlikely that they would significantly exceed vibrations levels experienced within the proposed ATCT. Off-base receptors are not exposed to vibration levels from Tinker AFB aircraft operations that exceed background vibration levels (Figure 3-11). Human response to vibration is depicted in Table 3-7.





**Table 3-7 Human Response to Vibration**

Response Level	Peak Particle Velocity (inches per second)
Imperceptible	0.001 to 0.01
Slightly Perceptible	0.01 to 0.03
Distinctly Perceptible	0.03 to 0.1
Strongly Perceptible	0.1 to 0.3
Disturbing	0.3 to 0.93
Very Disturbing	0.93 +

Source: American National Standards Institute 1983, Wiss 1981

### 3.9.2.3 Noise Abatement Procedures

Avoidance of noise-sensitive areas is emphasized and takeoff patterns are routed to avoid these locations as much as possible. For example, the majority of departures and approaches occur on Runway 17/35 to avoid populated areas. Also, efforts are made to control and schedule missions to keep noise levels low, especially at night. Twelve noise complaints were registered in 2005 and 8 noise complaints were registered as of 4 December 2006 at Tinker AFB; however, these complaints cannot be exclusively attributed to aircraft operations associated with based aircraft and transient military aircraft also utilize Tinker AFB's airfield (Tinker AFB 2006b).

## SECTION 4

### ENVIRONMENTAL CONSEQUENCES

This section evaluates the potential environmental consequences resulting from implementation of the Proposed Action or alternatives. Analyses are presented by resource area, as presented in *Section 3, Affected Environment*.

#### 4.1 Air Quality

##### 4.1.1 Approach to Analysis

The 1990 Amendments to the CAA require that federal agency activities conform to the SIP with respect to achieving and maintaining attainment of NAAQS and addressing air quality impacts. The USEPA General Conformity Rule requires that a conformity analysis be performed which demonstrates that a Proposed Action does not: 1) cause or contribute to any new violation of any NAAQS in the area; 2) interfere with provisions in the SIP for maintenance or attainment of any NAAQS; 3) increase the frequency or severity of any existing violation of any NAAQS; or 4) delay timely attainment of any NAAQS, any interim emission reduction, goals, or other milestones included in the SIP for air quality. A conformity review must be performed when a federal action generates air pollutants in a region that has been designated a nonattainment or maintenance area for one or more NAAQS. Nonattainment areas are geographic regions where the air quality fails to meet the NAAQS. Maintenance areas are regions where NAAQS were exceeded in the past, and are subject to restrictions specified in a SIP-approved maintenance plan to preserve and maintain the newly regained attainment status. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination if the total net increase in emissions of individual nonattainment or maintenance area pollutants resulting from implementation of the Proposed Action fall below the significant (*de minimis*) threshold values.

##### 4.1.2 Impacts

###### 4.1.2.1 Proposed Action

Pollutant emissions associated with implementation of the Proposed Action at Tinker AFB would include construction emissions (i.e., fugitive dust emissions) generated during ground disturbance and related site preparation activities and combustion emissions from vehicles and heavy-duty equipment used during construction of the new building and parking area. However, construction emissions would be temporary and would not occur beyond completion of construction activities. Oklahoma County is in an Early Action Compact Agreement with USEPA for the 8-hour ozone standard and is designated as an *attainment* area in compliance with all NAAQS.

## **Construction Emissions**

### *Dust Emissions*

Under implementation of the Proposed Action, dust (i.e., PM<sub>10</sub>, a criteria pollutant) would be generated during construction activities including vegetation removal, grading, and demolition. Dust emissions can vary substantially daily depending on levels of activity, specific operations, and prevailing meteorological conditions. Based on similar studies at other facilities the expected emission rate is 1.2 tons of dust generated per acre per month of activity (USEPA 1995). Based on this dust-generation factor and the maximum estimated acreage that could be disturbed at any one time, (e.g., simultaneous ground-disturbing of 0.05 acres for the ATCT footprint, 0.17 acres for access road, 0.17 acres for the parking lot, and 0.05 acres for construction staging) a projected total of approximately 0.45 acres could be disturbed which would generate approximately 0.54 tons of dust; this estimate is conservatively high and is based on the highly unlikely scenario that all proposed construction would occur within a one-month time period.

Increased PM<sub>10</sub> emissions resulting from proposed construction activities would comprise short-term adverse impacts that could be mitigated through standard dust minimization practices, such as watering exposed soils, soil stockpiling, and soil stabilization. After initial site preparation and grading activities are completed, dust emissions would be significantly less, and once operational, long-term emissions from developed facilities would be negligible.

### *Combustion Emissions*

Combustion emissions associated with construction-related vehicles and equipment would be minimal because most vehicles would be driven to and kept at the affected site for the duration of construction activities. Furthermore, as is the case with PM<sub>10</sub> emissions associated with site preparation activities, emissions generated by construction equipment would be temporary and short-term.

## **Operational Emissions**

Implementation of the Proposed Action would not result in any additions to personnel; therefore, no additional combustion emissions related to personnel transportation would result. Given that the proposed ATCT would house equipment currently in use in the existing ATCT, no new equipment that would have substantial emissions would be introduced. Therefore, a Prevention of Significant Deterioration (PSD) permit is not required. Emissions generated by implementation of the Proposed Action are expected to be below *de minimis* levels.

#### **4.1.2.2 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 would result in the remodel of an existing building and would not result in either significant ground-disturbing activities or construction emissions. Similar to the Proposed Action, no additions to personnel would occur; therefore, no additional operational emissions would result from implementation of this alternative. In addition, the alternative ATCT site would house existing ATCT equipment; therefore, no additional equipment that would introduce new or generate substantial emissions would be introduced. Impacts to air quality would be expected to be below *de minimis* levels.

#### **4.1.2.3 Alternative 2: No-Action Alternative**

If the No-Action Alternative were selected, the new ATCT building would not be constructed. Therefore, conditions would remain as described in *Section 3.1, Air Quality* and use of existing equipment in current configurations would continue; therefore, no impacts to Air Quality would occur.

### **4.2 Water Resources**

#### **4.2.1 Approach to Analysis**

Significance criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. An impact to water resources would be significant if it would 1) reduce water availability to or interfere with the supply of existing users; 2) create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources; 3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; 4) threaten or damage unique hydrologic characteristics; or 5) violate established laws or regulations that have been adopted to protect or manage water resources of an area including wetlands. Impacts of flood hazards on Proposed Actions are significant if such actions are proposed in areas with high probabilities of flooding.

#### **4.2.2 Impacts**

##### **4.2.2.1 Proposed Action**

##### **Surface Water**

The Proposed Action would involve new construction on currently undeveloped ground. This would increase the potential for soil erosion during construction, resulting in possible adverse impacts on water quality. Construction would require that a SWPPP be submitted by the contractor to Tinker AFB and would include BMPs to minimize pollution from construction. Contaminants, such as petroleum hydrocarbons, in run-off from developed areas of the site, including industrial areas or parking lots, could impact water quality in the area. These impacts would be minimized assuming existing non-point source pollution requirements are met and spill prevention and response procedures are implemented at the site. Furthermore, implementation

1707 of BMPs, (e.g., silt fencing, berm construction around construction sites, etc.), would minimize  
1708 this potential to negligible impacts during construction. Over the long-term, no operations that  
1709 would affect surface water are anticipated to occur.

1710 The increase in impermeable surface at the site would be mitigated through the construction of  
1711 stormwater control mechanisms, such as stormwater retention ponds or channeling stormwater  
1712 flows to non-flood prone areas. Discharges of pollutants by stormwater from parking lots would  
1713 be eliminated or minimized to the maximum extent practicable. Stormwater control features  
1714 would be included in the design to eliminate trash, debris, oil/grease, and other pollutants  
1715 commonly found in parking lots and industrial areas. Furthermore, introduction of new  
1716 impermeable surfaces would be offset by the reintroduction of permeable surfaces (i.e., grass) at  
1717 the existing ATCT site following its demolition. Therefore, implementation of the Proposed  
1718 Action would not have adverse impacts to surface water.

#### 1719 **Groundwater**

1720 The Proposed Action site does not overlie any known groundwater contamination. It is unlikely  
1721 that groundwater quality would adversely affect or be affected by constructing a new facility on  
1722 this site assuming required controls on the handling of hazardous materials and for spill  
1723 prevention and cleanup are implemented to protect groundwater. Also, the proposed building  
1724 and parking area does not comprise a significant water user or wastewater generator. Finally, the  
1725 project site does not overlie an identified groundwater recharge zone of special significance and  
1726 the footprint of facility development is an extremely small component in comparison with the  
1727 total acreage of the base; therefore, the footprint of facility development is negligible with regard  
1728 to groundwater area below the region. Therefore, implementation of the Proposed Action would  
1729 not have an adverse impact on groundwater resources.

#### 1730 **Wetlands**

1731 Implementation of the Proposed Action would not eliminate, modify, or otherwise impact any  
1732 existing wetlands on Tinker AFB. Therefore, implementation of the proposed action would not  
1733 have an adverse impact on wetlands.

#### 1734 **Floodplains**

1735 No 100-year or 500-year floodplains have been identified on the site identified for the Proposed  
1736 Action. The increase in impermeable surfaces at the site by the construction of the proposed  
1737 parking lot and the building footprint, considered negligible with relationship to the size of the  
1738 entire watershed, would be mitigated through the construction of stormwater control  
1739 mechanisms, such as stormwater retention ponds or channeling stormwater flows to non-flood  
1740 prone areas. Furthermore, since the current ATCT facility is located in a USACE and FEMA  
1741 designated 100-year floodplain, removal of the current ATCT facility and installation of open  
1742 grass would add permeable surface back to the existing floodplain. Therefore, relocating the  
1743 ATCT facility to the proposed site would benefit the 100-year floodplain.

#### **4.2.2.2 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 would involve remodeling an existing building and would not negatively impact water resources conditions. This alternative would also involve the reintroduction of permeable surfaces (i.e., grass) at the existing ATCT site following its demolition. Therefore, implementation of Alternative 1 would not result in adverse impacts to surface water. Further, since the current ATCT facility is located in a USACE- and FEMA-designated 100-year floodplain, removal of the current ATCT facility and installation of open grass would reinstate permeable surface to the existing floodplain. Therefore, relocating the ATCT facility to the proposed site would result in beneficial impacts to the 100-year floodplain.

#### **4.2.2.3 Alternative 2: No-Action Alternative**

If the No-Action Alternative were selected, proposed construction activities would not be implemented and water resources – including floodplains – conditions would remain unchanged from their current status, as described in *Section 3.2*. Selection of the No-Action Alternative would not further impact regional or local water resources and would not contribute permeable surfaces to the 100-year floodplain, where the current ATCT facility is located.

### **4.3 Biological Resources**

#### **4.3.1 Approach to Analysis**

Determination of the significance of potential impacts to biological resources is based on 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts to biological resources are significant if species or habitats of foremost concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of high concern.

USFWS data, ODWC data, and the Tinker AFB *Integrated Natural Resources Management Plan* were reviewed to determine the presence or potential occurrence of sensitive species and habitats in the study area. Potential physical impacts such as habitat loss, noise, and impacts to surface water were evaluated to assess potential impacts to biological resources resulting from implementation of the Proposed Action and identified alternatives.

#### **4.3.2 Impacts**

##### **4.3.2.1 Proposed Action**

Impacts to biological resources are expected to be negligible. The wildlife habitat that would be cleared for construction is of relatively low quality. Wildlife habitat of higher quality exists to the north, south, and east of the proposed location. Therefore, individual animals that may be displaced by construction could easily find more desirable habitat a short distance away.

Implementation of the Proposed Action would negligibly affect the wildlife species that may forage or transit the site. These species are common and mobile; therefore, these wildlife species could easily avoid direct impacts from the construction activities and forage in nearby unimproved areas. Also, the Proposed Action would occur in an area already disturbed by noise and heavy activity associated with flight and airfield operations. Operations at the facility would occur indoors and thus away from potential encounters with wildlife; therefore, no long-term impacts to wildlife would occur under the proposed action.

#### **4.3.2.2 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 at this site would involve remodeling an existing building and would not occur within any areas currently used by wildlife. Alternative 1 would occur in an area already disturbed by noise and heavy activity associated with flight and airfield operations. Operations at the facility would occur indoors, away from potential encounters with wildlife. Therefore, no impacts to biological resources would be expected.

#### **4.3.2.3 Alternative 2: No-Action Alternative**

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action. Therefore, no impacts to existing biological resources, as described in Section 3.3, would result from selection of the No-Action Alternative.

### **4.4 Transportation and Circulation**

#### **4.4.1 Approach to Analysis**

Potential impacts to transportation and circulation are assessed with respect to anticipated disruption or improvement of current transportation patterns and systems; deterioration or improvement of existing levels of service; and changes in existing levels of transportation safety. Beneficial or adverse impacts may arise from the physical changes to circulation (e.g., closing, rerouting, or creating roads), construction activity, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes created by installation workforce or population changes. Adverse impacts on roadway capacities would be significant if roads with no history of exceeding capacity were forced to operate at or above their full design capacity.

#### **4.4.2 Impacts**

##### **4.4.2.1 Proposed Action**

##### **Construction-Related Impacts**

The Proposed Action project site is located in the general area of the existing Engine Hushhouse, B926, north of the existing Control Tower, in proximity to midfield. This location is approximately 1,750 feet west of the Runway 17/35 centerline and 7,500 feet east of the Runway 17 Threshold. Implementation of the Proposed Action would require delivery of materials to

construction sites and introduction of construction-related equipment and vehicles. However, construction traffic would make up only a small portion of the total existing traffic volume region base, and many of the construction vehicles would be driven to and kept on site for the duration of construction, resulting in very few actual increased trips. Furthermore, increases in traffic volumes associated with construction activity would be short-term; upon completion of construction, no long-term impacts to transportation systems would result.

### **Operation-Related Impacts**

Implementation of the Proposed Action would redirect current ATCT facility employees from B935, north to the proposed ATCT site. The majority of vehicle traffic associated with the proposed ATCT would enter the base via Tinker, Eaker, and Vance Gates. Personnel would access the new ATCT via an existing, active taxiway. Personnel will follow the same safety procedures currently in use for any vehicles entering an active airfield including access to active taxiways and runways. The Proposed Action includes an approximately 24-space parking area to accommodate 33 employees. The USAF has established guidelines (AFI 32-1084) intended to ensure that adequate parking is available at USAF installations; according to these standards, the ratio of available parking spaces to personnel should be no less than 38 percent of the largest shift of civilian employees; in this case, that acceptable ratio mandates just 13 spaces. With the re-routing of 33 employees, there would be minimal impact to transportation and circulation in this area and base-wide.

#### **4.4.2.2 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 would redirect current ATCT traffic from B935 (existing ATCT) to B240 (Alternative 1 siting). Currently, traffic near B240 is heavy; therefore, implementation of Alternative 1 could increase traffic and circulation problems in this part of the base. Furthermore, increases in traffic volumes associated with construction activity would be short-term; upon completion of construction, minimal impacts to transportation systems would result. Parking already exists in the area; therefore, this alternative would not create onsite parking deficiencies.

#### **4.4.2.3 Alternative 2: No-Action Alternative**

If the No-Action Alternative were selected, Tinker AFB would not implement the construction project. Therefore, no changes to transportation, parking, or circulation would occur.

### **4.5 Cultural Resources**

#### **4.5.1 Approach to Analysis**

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966 empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP.



Once cultural resources have been identified, significance evaluation is the process by which resources are assessed relative to significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Only cultural resources determined to be significant (i.e., eligible for the NRHP) are protected under the NHPA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by 1) physically altering, damaging, or destroying all or part of a resource; 2) altering characteristics of the surrounding environment that contribute to resource significance; 3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or 4) neglecting the resource to the extent that it deteriorates or is destroyed.

Direct impacts can be assessed by identifying the types and locations of Proposed Actions and determining the exact locations of cultural resources that could be affected. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utility services, and other support functions necessary to accommodate population growth. These activities and facilities' subsequent use can disturb or destroy cultural resources.

#### **4.5.2 Impacts**

##### **4.5.2.1 Proposed Action**

No NRHP-listed or eligible archaeological resources have been recorded on the site. However, the slight potential exists for currently buried remains to be uncovered during ground-disturbing activities (i.e., construction and expansion of facilities). If such resources were uncovered during development of the proposed project, activities would be suspended and Tinker AFB will consult with the Oklahoma SHPO to determine the significance of the resource(s).

There are no known federally recognized Native American lands or resources at Tinker AFB. Tinker AFB has started consultations with three Native American tribes (Seminole Nation, Osage Nation, and Muskogee Nation). They have verbally commented that they have no NAGPRA or AIRFA concerns. Additionally, they have communicated that Tinker AFB property is not suitable for religious or burial sites (Tinker AFB 2001).

If Native American lands or resources are determined to be present near the proposed project location, activities would be suspended until a qualified archaeologist and Native American representative could determine the significance of the resource(s). Therefore, based on information currently available, the proposed project would not impact cultural resources.

##### **4.5.2.2 Alternative 1: Alternative Siting for ATCT**

Tinker AFB's ICRMP requires that to the maximum extent feasible, NRHP-eligible buildings or structures be used rather than simply demolished (Tinker AFB 2005c). Implementation of Alternative 1 would involve remodeling Building 240, built in 1942 and eligible for listing on the

1885 NRHP. The actions involved with the building remodel would have an adverse affect on the  
1886 historic building. The potential for an inadvertent discovery of buried cultural material is  
1887 unlikely during the building remodel. If any remains were uncovered all activity would be  
1888 suspended until a qualified archaeologist could determine the significance of the resource(s).  
1889 Based on information currently available, implementation of Alternative 1 would have an  
1890 adverse impact on cultural resources.

#### 1891 **4.5.2.3 Alternative 3: No-Action Alternative**

1892 Under the No-Action Alternative the construction project would not be conducted; therefore, no  
1893 impacts to cultural resources would occur under implementation of this alternative.

### 1894 **4.6 Hazardous Materials and Wastes**

#### 1895 **4.6.1 Approach to Analysis**

1896 Numerous local, state, and federal laws regulate the storage, handling, disposal, and  
1897 transportation of hazardous materials and wastes; the primary purpose of these laws is to protect  
1898 public health and the environment. The significance of potential impacts associated with  
1899 hazardous substances is based on their toxicity, ignitability, and corrosivity. Impacts associated  
1900 with hazardous materials and wastes would be significant if the storage, use, transportation, or  
1901 disposal of hazardous substances substantially increases the human health risk or environmental  
1902 exposure.

#### 1903 **4.6.2 Impacts**

##### 1904 **4.6.2.1 Proposed Action**

1905 The purpose of the Proposed Action is to increase the efficiency of ATCT facility. The  
1906 increased efficiency would ultimately result in the demolition of the current ATCT facility. The  
1907 existing facility may contain asbestos and lead building materials, and consequently the  
1908 demolition of the existing ATCT facility would result in the generation of regulated waste.  
1909 Regulated waste would be transported offsite by licensed contractor for disposal.

1910 A diesel-powered generator would be utilized by the proposed ATCT facility to serve as a  
1911 backup power source. However, since no external fuel storage tank would be required, no  
1912 hazardous materials would be stored at the proposed facility. Therefore, only negligible  
1913 temporary impacts involving hazardous materials and wastes would occur as a result of the  
1914 Proposed Action.

##### 1915 **4.6.2.2 Alternative 1: Alternative Siting for ATCT**

1916 Impacts resulting from the implementation of Alternative 1 would be the same as the Proposed  
1917 Action; an increase in the volume of regulated wastes generated could occur during the  
1918 demolition of the existing ATCT. However, the increased volume would be temporary. Only  
1919 negligible impacts involving hazardous wastes would occur as a result of this alternative.

1920 **4.6.2.3 Alternative 2: No-Action Alternative**

1921 If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed  
1922 Action. Therefore, no impacts with regard to hazardous materials would occur and conditions  
1923 would remain as described in *Section 3.6*.

1924 **4.7 Visual Resources**

1925 **4.7.1 Approach to Analysis**

1926 Determination of the significance of impacts to visual resources is based on the level of visual  
1927 sensitivity in the area. Visual sensitivity is defined as the degree of public interest in a visual  
1928 resource and concern over adverse changes in the quality of that resource. In general, an impact  
1929 to a visual resource is significant if implementation of the Proposed Action would result in  
1930 substantial alteration to an existing sensitive visual setting.

1931 **4.7.2 Impacts**

1932 **4.7.2.1 Proposed Action**

1933 The proposed ATCT Facility would be visually consistent with existing structures and activities  
1934 at the installation and in the vicinity of the proposed project site. Furthermore, given that the  
1935 visual environment of Tinker AFB does not constitute a unique or sensitive viewshed, no  
1936 detrimental impact to regional visual resources would occur upon implementation of the  
1937 Proposed Action.

1938 **4.7.2.2 Alternative 1: Alternative Siting for ATCT**

1939 Impacts resulting from the implementation of Alternative 1 would be the same as the Proposed  
1940 Action; overall visual characteristics at the installation and views from off site areas would not  
1941 be affected with implementation of this alternative. The visual environment of Tinker AFB does  
1942 not constitute a unique or sensitive viewshed; therefore, impacts to regional visual resources  
1943 would be negligible under Alternative 1.

1944 **4.7.2.3 Alternative 3: No-Action Alternative**

1945 No impacts to existing visual resources at or in the vicinity of Tinker AFB would occur if the  
1946 No-Action Alternative were selected and visual resources conditions would remain as described  
1947 in *Section 3.7*.

1948 **4.8 Safety**

1949 **4.8.1 Approach to Analysis**

1950 Determination of the significance of potential impacts to safety is based on the level of increased  
1951 risks associated with aircraft mishap potential or flight safety relevant to the public or the  
1952 environment. For example, if an action involved an increase in aircraft operations such that

1953 mishap potential would increase significantly, air safety would be compromised. Conversely,  
1954 beneficial impacts would include those reducing exposure to mishaps.

## 1955 **4.8.2 Impacts**

### 1956 **4.8.2.1 Proposed Action**

1957 The existing ATCT facility is over 35 years old and was designed to accommodate only ATC  
1958 operations and with limited equipment space. The required numbers of personnel, combined  
1959 with the required equipment upgrades, continue to reduce the available space in the cab, which is  
1960 unsuitable for day-to-day operations. The overcrowded conditions jeopardize flying safety and  
1961 delay flying operations. The demands placed on the existing tower make it unsuitable for further  
1962 growth and degrade the adequacy of the work environment. Flight safety, as well as the safety of  
1963 moving aircraft or vehicles on airfield surfaces, would remain impaired. The existing ATCT  
1964 facility violates current Air Force siting criteria because it is located less than 1,000 feet from the  
1965 runway centerline, within the primary airfield surface which comprises surfaces of the runways,  
1966 runway shoulders, and lateral safety zones. The length of the primary surface extends 200 feet  
1967 beyond each end of the runway; the width of the primary surface is 2,000 feet (1,000 feet each  
1968 side of the runway centerline). This placement within the primary airfield surface presents a  
1969 safety risk. Therefore, implementation of the Proposed Action would benefit the safety of flying  
1970 operations at Tinker AFB and the surrounding communities.

1971 An additional major concern is the lack of fire suppression and evacuation systems in the current  
1972 ATCT currently including a set of stairs, leading to the tower cab, that are steep and not very  
1973 deep. Several controllers have fallen or lost their footing and slid down the stairs. The new,  
1974 standard ATCT has a set of stairs that is safe for day-to-day operations as well as for fire  
1975 evacuation and as a secondary egress system. Unlike the current ATCT, the new ATCT design  
1976 complies with applicable AF directives, MIL HDBK 1008c *Fire Protection for Facilities*,  
1977 *Engineering, Design, and Construction*, National Fire Codes, NFPA 101, and the *Uniform*  
1978 *Building Code* (UBC). The current ATCT design creates tower evacuation when winds exceed  
1979 60 knots (69 mph). The new ATCT will be designed to withstand sustained wind speeds of  
1980 88 knots (101 mph) and would allow personnel to safely remain in the control tower at higher  
1981 wind speeds than structural conditions currently permit. Therefore, the implementation of the  
1982 Proposed Action would benefit both personnel and structure safety.

### 1983 ***Accident Protection Zones***

1984 All proposed construction activities identified in the Proposed Action have been designed and  
1985 sited to comply with all airfield safety criteria and are consistent with guidelines established in  
1986 the base's *Master Plan*. No facilities development is proposed within airfield CZs or APZs;  
1987 Furthermore, implementation of the Proposed Action would not result in a change in shape or  
1988 shift in location of established CZs or APZs. Current land use incompatibilities exist within  
1989 APZs I and II off Runways 17 and 12, respectively; however, no new incompatible land use  
1990 would be introduced as a result of implementation of the Proposed Action.

1991 The majority of vehicle traffic associated with the proposed ATCT would enter the base via  
1992 Tinker, Eaker, and Vance Gates. Personnel would access the new ATCT via an existing, active  
1993 taxiway. Personnel will follow the same safety procedures currently in use for any vehicles  
1994 entering an active airfield including access to active taxiways and runways. Therefore, no  
1995 adverse impacts to airfield safety would result from implementation of the Proposed Action.

#### 1996 **4.8.2.2 Alternative 1: Alternative Siting for ATCT**

1997 Implementation of Alternative 1 would involve remodeling Building 240 to include the proposed  
1998 ATCT. This location would provide adequate visibility of all airfield movement areas except the  
1999 munitions ramp, which is not currently visible. In addition, siting the ATCT in this location  
2000 would allow the aircraft traffic pattern to remain in a standard configuration, passing in front of  
2001 the controllers. Therefore, no adverse impacts to airfield safety would be expected from  
2002 implementation of Alternative 1.

#### 2003 **4.8.2.3 Alternative 3: No-Action Alternative**

2004 If the No-Action Alternative were selected, unsafe conditions would continue in the existing  
2005 ATCT facility. Therefore, safety conditions would remain as described in *Section 3.8, Safety* and  
2006 implementation of this alternative would be considered adverse to safety.

### 2007 **4.9 Noise and Vibration**

#### 2008 **4.9.1 Approach to Analysis**

2009 Noise and vibration impact analyses typically evaluate potential changes to existing conditions  
2010 that could result from implementation of a Proposed Action. Potential changes may be  
2011 beneficial if they reduce the number of sensitive receptors exposed to unacceptable noise or  
2012 vibration levels. Conversely, changes may be detrimental if they result in increased exposure to  
2013 unacceptable noise and vibration levels. An increase in noise and vibration levels due to  
2014 introduction of a new noise source can create an impact on the surrounding environment to both  
2015 persons and structures on- and off-base.

2016 The human reaction to various levels of noise and vibration is highly subjective, and varies from  
2017 person to person. Specific vibration levels have the potential to damage structures; however,  
2018 damage is dependent on numerous factors including vibration level, structure construction,  
2019 duration of exposure, etc.

2020 Vibration levels associated with proposed T-10 hush house operations and impact evaluation on  
2021 the proposed ATCT were determined using previous T-10 hush house studies and steady-state  
2022 vibration principles.

## 2023 **4.9.2 Impacts**

### 2024 **4.9.2.1 Proposed Action**

2025 Implementation of the proposed ATCT site would not result in additional noise and vibrations  
2026 beyond the construction phase. The ATCT site is located within the airfield and would be  
2027 subjected to noise and vibration levels consistent with airfield operations, including T-10 hush  
2028 house operations. However, these levels would not adversely impact the control tower structure  
2029 or ATCT operations or personnel.

2030 Currently, noise exposure of 65 Ldn or higher associated with total military aircraft operations at  
2031 Tinker AFB affects approximately 5,544 acres beyond the base boundary. The off-base area  
2032 affected by noise levels of 65 Ldn or greater would not increase upon implementation of the  
2033 Proposed Action. Implementation of the Proposed Action would not increase noise exposure  
2034 within the base boundary.

2035 According to the USAF, a significant noise impact would occur if analysis shows that the  
2036 Proposed Action would cause noise-sensitive areas to experience increased noise exposure to  
2037 unacceptable levels. Implementation of the Proposed Action would not result in any sensitive  
2038 receptors (e.g., residences, schools, etc.) currently within the baseline 65+ Ldn and higher  
2039 contours to experience an increase in sound levels. Therefore, impacts to the surrounding  
2040 community and on-base receptors at Tinker AFB would not be significant.

2041 Established criteria for noise associated with a T-10 hush house suggest that sound levels should  
2042 not exceed 89 dBA anywhere beyond a 250-foot radius, which is sufficient to alleviate any  
2043 health concerns related to audible noise (Oak Ridge National Laboratory no date). Given that  
2044 this separation criterion is a USAF requirement and the proposed ATCT is approximately 400  
2045 feet (ft) from the hush house, sound levels from proposed operations would not be detrimental to  
2046 those who work within or operations associated with the proposed ATCT.

### 2047 2048 **T-10 Hush House Vibration**

2049 A significant impact from vibration would occur if analysis determined that the Proposed Action  
2050 would cause persons or structures in on- or off-base areas to experience unacceptable vibration  
2051 levels or if vibration levels would detrimentally affect the proposed project. Unacceptable  
2052 vibrations levels could result in annoyance to persons and damage to structures.

2053  
2054 An acceleration (g) of 0.01 is recommended as a threshold for structural impacts as long-term  
2055 structural damage may occur for wall accelerations greater than 0.01 g (Bolz and Tuve 1976;  
2056 Witten 1987). One study at Langley AFB of a F100-PW-100 engine operating at maximum  
2057 power (afterburner) within a T-10 hush house resulted in an acceleration of approximately 0.002  
2058 to 0.005 g at 10 to 15 Hz and a distance of 400 ft from the rear of the hush house (i.e., in the  
2059 direction of the engine exhaust) (Goerke et al. 1990). Given these values and incorporating  
2060 steady-state vibration principles, a displacement of approximately 0.0002 inches and peak

particle velocity (PPV) of 0.012 to 0.021 inches/second would be expected. A PPV of 0.012 to 0.021 inches/second is below Maximum Allowable Ground Motion at Structures from Blasting Activities and “Slightly Perceptible” according to the American National Standards Institute (ANSI) Allowable Continuous/Intermittent Vibration Levels from 7:00 AM to 10:00 PM (ANSI 1983). The structure closest to Building 926 (the T-10 hush house) would be the proposed ATCT, located approximately 300 ft east of both the engine test stand within the hush house and end of the augments tube. Given the proposed ATCT location relative to the engine test stand within the hush house and the augments tube (90 degree angle), sound pressure levels would be anticipated to be reduced by approximately 10 percent below what would be experienced directly behind the engine test stand and augments tube (180 degrees) (Lee 1982). Also, afterburner use would occur for approximately 300 seconds per day, but afterburner use would not exceed a 5-second continuous period. Power settings below afterburner would occur more frequently but would result in a lower PPV (i.e., reduced vibrations) when compared to afterburner settings. Given the distance and angle of the proposed ATCT in relation to the location of Building 926, impacts associated with vibration levels would be negligible. This would result in a further reduction in PPV than presented above. Given the distance and angle of the proposed ATCT in relation to the location of Building 926, no detrimental impacts associated with vibration levels would occur to the control tower structure or ATCT operations or personnel.

Although vibration levels associated with engine tests at afterburner within the hush house would likely be slightly perceptible, it is unlikely that they would significantly exceed current vibrations levels experienced within the ATCT (i.e., those associated with afterburner departures of aircraft whose engines are not suppressed). No chronic or acute human health impacts would be expected to occur. Levels of vibration sufficient to cause human discomfort or annoyance may occur during engine testing in the afterburner mode; however, duration and frequency of these tests are typically 300 seconds, once per day but not for more than a 5-second continuous period (Oak Ridge National Laboratory 1993). Therefore, impacts to persons from vibrations associated with T-10 hush house operations would not be detrimental.

#### **Construction-Related Noise**

Implementation of the Proposed Action would have minor, temporary effects on the noise environment in the vicinity of Building 926 during construction activities associated with ATCT. Use of heavy equipment for the construction of the ATCT would generate noise exposure similar to existing ambient levels at the base. Noise generation would be typical of construction activities, short-term, and occur during normal working hours (i.e., between 7:00 AM and 5:00 PM). Therefore, noise generated by construction of the ATCT associated with implementation of the Proposed Action would not impact sensitive receptors on or in the vicinity of Tinker AFB.

#### **4.9.2.2 Alternative 1: Alternative Siting for ATCT**

Implementation of Alternative 1 would involve remodeling Building 240 to include the proposed ATCT. The location would provide adequate visibility of all airfield movement areas except the

munitions ramp, which is not currently visible. In addition, siting the ATCT in this location would allow the aircraft traffic pattern to remain in a standard configuration, passing in front of the controllers. Building 240 is not currently subjected to noise and vibration levels associated with T-10 hush house operations. Therefore, impacts associated with noise and vibration would not be expected to occur under implementation of this alternative.

**4.9.2.3 Alternative 2: No-Action Alternative**

If the No-Action Alternative were selected, Tinker AFB would not implement the Proposed Action. Therefore, conditions would remain as described in *Section 3.9, Noise and Vibration* and no impacts would occur.



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**SECTION 5**  
**CUMULATIVE IMPACTS**

Cumulative impacts on environmental resources result from incremental impacts of the Proposed Action when combined with other past, present, and reasonably foreseeable future projects in an affected area. Cumulative impacts can result from minor but collectively substantial actions undertaken over a period of time by various agencies (federal, state or local) or persons. In accordance with the National Environmental Policy Act, the cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future are discussed below.

Projected projects occurring in other areas of Tinker AFB and in the vicinity of Tinker AFB for the next five years are included in Table 5-1.

**Table 5-1 Projects Occurring at or near Tinker AFB.**

<b>DMRT Three Bay Hangar</b>	Construction of a three-bay, multi-aircraft fuel-capable hangar sized for KC-135, E-3, B-1, B-52, and KC-X (Next generation) tanker aircraft. The facility is proposed for construction west of B2280 (which is located on the industrial east side of the base). The new facility is required as part of the Programmed Depot Maintenance (PDM) for KC-135. Workload and repairs for this aircraft take place in three separate facilities that are inadequate in size. The new hangar is required to adequately address these issues and also to consolidate workload and function, improving efficiency.
<b>Military Family Housing Privatization</b>	Air Force implementation of the privatization initiative which involves leasing of all housing areas to a private developer for 50 years. The Air Force also will convey all 694 existing military units to the developer and depending on the alternative selected the developer would implement a combination of demolition, renovation, and /or construction of housing units to meet the end-state requirement of 660 housing units. Once privatization is implemented, the developer will own, operate, and manager all housing units on the installation while leasing the land underlying the housing communities (approximately 224 acres) for a period of 50 years. Depending on the developer, there will be a combination of demolition, renovation, and new construction distributed throughout the military family housing areas. Included will be alternatives to desired community features such as a sound protection buffer along Sooner, lighted tennis and basketball courts, and an outdoor fitness area.
<b>Relocate 137 Airlift Wing of Air National Guard</b>	The relocation of operations and maintenance personnel associated with the 137 Airlift Wing (AW) of the Air National Guard from Will Rogers Air Guard Station (AGS) to Tinker AFB, where the 137 AW will become an associative wing, operating with the 507 <sup>th</sup> Air Refueling Wing of the Air Force Reserve Command. Although the 137 AW currently operates eight C-130 cargo aircraft, those aircraft will not follow the 137 AW to Tinker AFB but rather relocated to Pope AFB in Fayetteville, North Carolina. Construction of Air Force Reserve Command and Air National Guard squadron operations, operations support squadron, life support storage, and life support work area will be completed to support the relocation.

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**Table 5-1 Projects Occurring at or near Tinker AFB (continued)**

<b>Transfer 939 Air Reserve Wing to Tinker AFB</b>	The transfer of four KC-135R aircraft from the 939 Air Reserve Wing from Portland International Airport AGS to Tinker AFB. To implement this action, Tinker AFB has proposed the construction of a new hangar with hangar access and associated demolition of Building 1037 and Building 1041, which would also correct a current deficiency at Tinker AFB
<b>DLA Warehouse</b>	Construction of a 167,575 square foot, permanent, non-combustible, general purpose warehouse with a 25' clear stack height, weather sealed door trucks, loading/unloading docks with dock levelers, paved roadways, and connection. The facility will require steam heat from the Central Heat Plant or boiler. All electrical, mechanical, and fire protection system will meet national, state, and local code requirements. Annex shall house a 123 square meter administrative area with a lunch/break area, restrooms, and locker rooms. A utility annex shall house all the utility functions for this facility. There are 18 depots within the continental US, most of which are located on active military bases. These depots support the mission of the Military Installation on which they are located. These Depots also store general commodities. Base Realignment and Closure (BRAC) identified the requirement for construction of additional warehouses at the Defense Distribution Depot Oklahoma City (located at Tinker AFB). This is a BRAC requirement.
<b>Construct Medical Clinic</b>	Construction of a new medical clinic, approximately 172,000 sq ft in the open land area northeast of Gott Gate. The new facility will replace the existing clinic and would result in the demolition of the Central Plant, which contains both the chillers and boilers that service the clinic. Demolition of the boiler would also result in de-commissioning an underground diesel storage tank. This proposed project will also include a medical squadron building as well as the War Readiness Materials warehouse. The new clinic will house doctors' offices, exam and treatment rooms, laboratories, radiology, pharmacy, dental clinic, conference and training rooms, as well as storage areas. Energy to operate the new boilers will include a combination of diesel fuel, stored in above ground storage tank and natural gas. The existing medical clinic will also be demolished (approximately 184,000 square feet). Upon completion of the new facilities, the existing medical clinic and TRICARE facility (B5803) will also be demolished.
<b>Child Development Center</b>	Construction of a new Child Development Center in the southwest portion of the Base, north of Southeast 59 <sup>th</sup> Street and northwest of Gott Gate in the South Forty Area. Size of the facility would be approximately 32,877 square feet. The proposed action would be located approximately 375 feet west of Air Depot Road and approximately 100 feet north of the base fence line. Approximately 130 feet of the Urban Greenway Multi-Use Trail would be removed and re-routed as a result. The new Child Development Center will provide for the care and training of dependent children of both military and civilian personnel assigned to the base. The building will contain areas for child activities, staff support, facility support, core administration, and maintenance. 2.1 acres of land will be required surrounding the facility.
<b>Tinker Aerospace Complex (TAC)</b>	Demolish 39 substandard and deteriorated facilities on Tinker AFB and relocate select depot-level aircraft maintenance functions from those facilities to the former General Motors (GM) Assembly Plant adjacent to Tinker AFB. Tinker AFB would lease the former GM property as well as obtain access to a city-owned parcel that would connect Tinker AFB to the new property. Multiple construction projects are proposed to provide access to and secure the perimeter of the Tinker Aerospace Complex.

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**Table 5-1 Projects occurring at or near Tinker AFB (continued)**

<b>Harry Twaddle Acquisition</b>	The U.S. Army Reserve's 95th Division (Institutional Training) would move to Fort Sill. The facility is based at the Major General Harry Twaddle U.S. Armed Forces Reserve Center, Oklahoma City. The Reserves Center would be acquired by Tinker AFB. Approximately 152,000 square foot acquisition.
<b>T-10 Hush House (B926), B3234 Test Cell Facility, and B3772</b>	The T-10 hush house, located between two operational runways, will be re-activated. The T-10 hush house will be used for testing jet fighter engines and can accommodate either a bare engine mounted on a stand or installed in an aircraft. The sidewalls of the structure are composed of acoustic baffles designed to allow airflow into the building and attenuate sound leaving the building. The planned total number of engines to be tested annually in the T-10 facility is 106. The current plan is to construct two 50-foot-by-300-foot test facilities equipped to handle 150,000 pound-thrust-class engines. The proposed site for the new test complex is immediately south of B3234. B3772 is currently not in use and is scheduled to be demolished in 2010.
<b>Consolidated Security Forces, South 40 Development</b>	Construction of a 64,000 square foot facility on the south side of the base. This project is to construct a new facility to relocate and consolidate key Security Police Operations functions at a single facility. One centralized facility will reduce the response time to react to various situations.
<b>Construct Consolidated Wing Headquarters Facility</b>	Construction of a consolidated wing headquarters building for distinct legal staff to include a Headquarters Command Section, Resource Manager, Public Affairs, Base Plans, 72 Mission Support Group. 72 Mission Support Squadron, as well as a large Staff Judge Advocate facility. Project involves construction of a multi-story steel frame building on piers and concrete slab. Demolition of B460 and reconfiguration of the road intersection at Arnold and F Streets will also be included in the project. Construction of the new facility is required because the existing building is antiquated and is in violation of the American Disabilities Act. Existing facility also does not meet the Air Force Legal Facilities Design Guide and has insufficient Indoor Air Quality. There are problems with mold, wood rot, and the building has suffered termites in the past.
<b>Realignment of Air Depot Road/Tinker Gate</b>	Relocation of Air Depot Road/Tinker Gate located on the west side of the base. Relocation is required to provide an adequate and secure base entry. Relocation will alleviate current hazardous traffic congestion and will maintain the base perimeter security. The existing roadway alignment poses a safety issue and does not meet security requirements.
<b>Phase III, 3<sup>rd</sup> Combat Communications Complex</b>	The purpose of this project is to design and construct a new Squadron Operations Complex for the 32 <sup>nd</sup> Combat Communications Squadron at Tinker AFB. The new facility will replace thirteen substandard existing facilities. The new consolidated facility will enhance the squadron's capability to train, maintain its equipment and to deploy to any location in the world. The 3rd Combat Communications Group is a tenant on Tinker AFB that provides deployable communications, computer systems, navigational aids and air traffic control services anywhere in the world. The new facility will support a squadron of approximately 141 personnel. The site is located east of Air Depot north of Reserve Road. The Squadron Operations Complex is organized around a core containing the common areas: restrooms, supply room, conference room and training room for all Flights. There are three flight bays located off the core area that provide each flight with conditioned office space, electronic workbenches and drive through bay areas to store, palletize and maintain deployable equipment. The front of the facility contains offices for the Squadron Commander and the Squadron administrative functions.

The projects listed above are planned for construction during roughly the same timeframe as implementation of the Proposed Action would occur. Consequently, the potential exists for cumulative environmental impacts to occur with regard to air quality, noise, socioeconomics, and traffic. Cumulative air quality and noise impacts are expected to be less than significant since all projects would be required to implement BMPs to reduce air and noise emissions below significance thresholds and comply with local noise regulations. The T-10 hush house is located in proximity to the Proposed Action site. Testing of jet engines in the hush house will generate noise similar to the noise emissions generate during airfield operations. The T-10 hush house operations would result in an increased number of engine test operations at Tinker AFB. Operations would include approximately 1.6 engine tests per day and 464 tests annually. The purpose of the T-10 hush house is to quiet the noise of engine testing, and therefore the noise produced during testing would be less than that of takeoffs. Only slight expansion of noise contours – and related noise exposure – would occur on-base, and these increases would be clustered around Building 926 and would be indistinguishable from sound levels associated with current aircraft operations. However, the proposed T-10 hush house operations will be designed to reduce noise emissions from engine testing and has gone through the Environmental Analysis Impact Process. The proposed ATCT would be designed to reduce noise emissions; therefore, noise impacts from the T-10 hush house combined with the airfield noise impacts are expected to be below significant thresholds and comply with local noise regulations.

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2247 72 ABW/CEAR and AMEC Earth & Environment, Inc. April.



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**APPENDIX A**  
**PUBLIC NOTICE**

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STATE OF OKLAHOMA, }  
COUNTY OF OKLAHOMA } ss.

### Affidavit of Publication

Gina Calame, of lawful age, being first  
duly sworn, upon oath deposes and says that he is the A.E.  
of The Oklahoma Publishing Company, a corporation, which is the publisher of the

The Oklahoman which is a daily newspaper  
of general circulation in the State of Oklahoma, and which is a daily newspaper  
published in Oklahoma County and having paid general circulation therein; that  
said newspaper has been continuously and uninterruptedly published in said coun-  
ty and state for a period of more than one hundred and four consecutive weeks next  
prior to the first publication of the notice attached hereto, and that said notice was  
published in the following issues of said newspaper, namely:

Fri. 2/20 - June 5  
for \$349.38

Subscribed and sworn to before me this 23rd

day of February, 20 09

Dianah Featherston Gina Calame  
Notary Public

My commission expires April 1, 2009





the right now if you want to, but I have to say this," Bentley recalled. "I feel like you talked about how you wanted to get back to a lot of fun on your record. I think you're missing a song or two. That's all I'm going to say."

Bentley, 34, went back to work writing and re-

balance. He thought there were too many serious songs. But he worried the young singer-songwriter might take his criticism the wrong way.

They apparently got it right, though. The album and the title track both hit No. 1 — Bentley's sixth

Fire" is all laughs. On "Beautiful World," Bentley, the father of a 4-month-old daughter, chooses to believe there is beauty beyond the barrage of bad news. On "Pray," a ballad he co-wrote with Rodney Crowell, he wishes peace to an ex-lover.

## Public Notice

### Tinker Air Force Base Invites Public Comment Environmental Assessments

Construct Air Traffic Control Tower  
Re-Alignment of Air Depot Gate

The United States Air Force and the 72nd Air Base Wing have prepared two Environmental Assessments (EAs) which are available for public review and comment.

Pursuant to the Council on Environmental Quality (CEQ) regulations and in accordance with the National Environmental Policy Act, an environmental assessment has been performed to evaluate the construction of a new Air Traffic Control Tower and a separate assessment to evaluate the Re-Alignment of Air Depot Gate.

No significant environmental impacts were identified through these EAs.

The public is invited to review the draft assessments and make comments. Written comments and questions can be submitted before close of business on the 6th day of March 2009.

The final drafts for the Environment Assessments are available to the public at the Tinker Information Repository located in the Midwest City Public Library on Reno Avenue. Hours of operation are 9:00 a.m. to 9:00 p.m. Monday thru Thursday; 9:00 a.m. to 5:00 p.m., Friday and Saturday; and 1:00 to 5:00 p.m. on Sunday.

The public may submit written comments to the address below:

72d Air Base Wing Public Affairs Office  
Brion Ockenfels  
7460 Arnold Ave., Suite 127  
Tinker Air Force Base, Oklahoma 73145  
Phone: 405-739-2027/26  
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Avoid the rigmarole of house hunting. You can quickly find the home of your dreams in the neighborhood you deserve with HomesOK.com. Search now without having to leave your computer, and get ready to do the happy dance. You're about to find your new home on HomesOK.com.

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